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CLAIMS

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[Claim(s)]

In Approach of Manufacturing Color Filter Component by Photolithography, \*\* Arrival of the Layer of Non-Particle-like Filter Ingredient is Substantially Carried Out to Filter Base Material. 1. Here The soluble pigment by which this filter coating ingredient was mixed with the vehicle by it is included. The process it is made to produce high color contrast and lightness while it is thermally stable, and this soluble pigment is combined with this vehicle and makes level of a back light low, The process which carries out \*\* arrival of the photoresist to the layer of the filter coating ingredient on a filter base material, The process which forms an image in a photoresist by the photolithography, develops negatives, and forms a pattern in this photoresist, This pattern is imprinted into a filter coating ingredient by etching the photoresist by which pattern formation was carried out. The process which forms the pattern of a color filter component in a color filter ingredient, and the process which is made to harden a color filter component and insolubilizes this component substantially are included. The stable coloring matter which this hardened filter element makes penetrate coloring light certainly, having high lightness, and disassembles is contained. Furthermore, the approach characterized by making it contain the stable coloring matter which has high resistance to the extraction and the staining by this hardened filter element adjoining and carrying out \*\* arrival of the consecutive filter.

2. Approach of claim 1 characterized by thing to which base material changes from filter element to two or more colors, and which is substantially done by plane array for coat.
3. Approach of claim 2 characterized by including process which is made to carry out orientation of filter coating ingredient in color filter component, and performs alignment.
4. Approach of claim 3 characterized by including process which carries out \*\* arrival of liquid crystal ingredient to filter coating ingredient which carried out orientation.

5. A vehicle is the approach of claim 1 characterized by including the anhydride content reforming copolymer which the reactant bridge formation component carried out graft association, and was blended with the polyfunctional bridge formation component.

In Approach of Manufacturing Micro Electron Filter Component by Micro Photolithography, \*\* Arrival of the Layer of Non-Particle-like Filter Ingredient is Substantially Carried Out to Filter Base Material. 6. Here The soluble pigment by which this filter coating ingredient was mixed with the vehicle by it is included. The process it is made to produce high color contrast and lightness while it is thermally stable, and this soluble pigment is combined with this vehicle and makes level of a back light low, The process which forms a pattern on a color filter ingredient, etches and forms a color filter component, The process which is made to harden a color filter component and is made to insolubilize this component substantially, The process which carries out \*\* arrival of the barrier coating to the colored filter element, The process which is made to harden barrier coating and insolubilizes this barrier coating substantially is included. The stable coloring matter which the hardened filter element makes penetrate coloring light certainly, having high lightness, and disassembles is contained. Furthermore, the approach characterized by giving high resistance to the extraction and the staining by hardened barrier coating adjoining and carrying out \*\* arrival of the consecutive filter.

In Approach of Manufacturing Micro Electron Filter Component by Micro Photolithography, \*\*

Arrival of the Layer of Non-Particle-like Filter Ingredient is Substantially Carried Out to Filter Base Material. 7. Here The soluble pigment by which this filter coating ingredient was mixed with the vehicle by it is included. The process it is made to produce high color contrast and lightness while it is thermally stable, and this soluble pigment is combined with this vehicle and makes level of a back light low, The process which carries out \*\* arrival of the photosensitive barrier coating to the layer of the filter coating ingredient on a filter base material, Carry out pattern formation of the photosensitive barrier coating with lithography, and this pattern is imprinted into a filter coating ingredient by the process and etching which develop the pattern of this photosensitive barrier coating. The process which forms the color filter component covered by barrier coating by which pattern formation was carried out, The process which is made to harden a color filter component and barrier coating, and insolubilizes substantially this color filter component and barrier coating is included. The stable coloring matter which the hardened color filter component makes penetrate coloring light certainly, having high lightness, and disassembles is contained. Furthermore, it is characterized by giving high resistance to the extraction and the staining by hardened barrier coating adjoining and carrying out \*\* arrival of the consecutive filter.

8. it be the coating ingredient characterize by to include the anhydride content reforming copolymer which high color contrast and lightness be produce while it be thermally stable , and this soluble pigment be combine with a vehicle and make level of a back light low including the fusibility extinction coloring matter which be the extinction nature coating ingredient use for a photolithography , and be mixed with the vehicle by it , as for this vehicle , graft association of the reactant bridge formation component be carried out , and be blended with the polyfunctional bridge formation component .

9. It is Color Filter Base Material Which Has Filter Element by Which Pattern Formation was Carried Out. This filter element contains a non-particle-like filter coating ingredient substantially. This filter coating ingredient contains the soluble pigment mixed with the vehicle by it. It is what produces high color contrast and lightness while this soluble pigment is thermally stable, it is combined with a vehicle and level of a back light is made low. Furthermore, the color filter base material characterized by this filter element having high resistance to the extraction and the staining from a contiguity filter.

10. A vehicle is the filter base material of claim 9 characterized by including the anhydride content reforming copolymer which the reactant bridge formation component carried out graft association, and was blended with the polyfunctional bridge formation component.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

reforming (maleic-anhydride-styrene) copolymer for base materials of a color filter and a relative -- polymer this invention -- ultraviolet [ of an electromagnetic spectrum ] -- it is related with the polymer ingredient used for the organic coloring agent which lets alternatively the frequency band of (uv), visible, or an infrared (ir) field pass (or it intercepts), and which is made like, and the information display unit and sensor for giving extraction / staining resistance which have coating which contains transparent barrier coating optically.

Prior art For manufacture of the color display of a flat panel form, and a color video detector, coloring polymer coating (a color filter is called hereafter) is used, and the array of a coloring pixel (in and the case [ Red, green in the case of / Usually / a flat-panel display ] of blue and a color video detector cyanogen, a Magenta, and yellow) is constituted in it. In a flat-panel display, a color filter (color filter) is arranged in the shape of [ a certain ] a pattern on a transparent base material (substrate), and alternative passage of the light from the light source located behind the array of this color filter may be made to be performed. In a color video detector, it lets the ambient light of predetermined wavelength pass using a color filter array to the array of the specific location of the semi-conductor photocell (photocell) arranged behind this color filter array.

It is required for manufacture of a color filter plate and a color video detector to demarcate the array of a coloring pixel using a FOTORISO graphic method. Two general approaches conventionally adopted as forming this pixel array are the wet etching method (solvent etching) and a dry etching method (plasma or reactive ion etching). It is required to carry out \*\* arrival of the color filter to homogeneity, and to form a film (typically color filter with a thickness of 1-2 micrometers) on a base material, also in which approach. Generally \*\* arrival of a color filter is performed by the approach learned as spin coating (spin spreading), and puts the solution of a color filter into the core of a revolving base material, and a front-face top is made to spread in homogeneity according to a centrifugal force.

the wet etching method -- a multistage story method -- it is -- typical -- 1 color filter -- \*\* arrival -- carrying out -- 2 -- weak -- heating (software BEKU) -- carrying out -- coating -- partial -- insolubilizing -- 3

A solvent is removed from the photoresist which carried out \*\* arrival of the photoresist, and exposed and carried out 5 exposure of the four photoresists, and the color filter under it, a solvent is removed from the photoresist of 6 remainder, and the process which carries out finishing hardening of the 7 color filters is included. Whenever it adds the color filter to be used, these processes are repeated, and a pattern is formed by alternative removal which carries out a consecutive color filter \*\* arrival, and mentioned it above on the color filter by which processing processing was carried out before.

Typically, a dry etching method carries out 1 color filter \*\* arrival, carries out 2 ignition (postbake), stiffens a polymer, and is a multistage story method including the process which carries out, removes a solvent from the photoresist by which 4 exposure was carried out, and removes the area which is not covered with a photoresist among the remaining photoresist and the color filter using 5 reactivity plasma \*\* arrival about three photoresists.

In order to manufacture a multicolor coloring array, it is required to cover each additional color filter on the color filter by which processing processing was carried out before. When another color filter is covered on the color filter by which processing processing was carried out before, the phenomenon called extraction (leaching) may happen. That is, the color filter by which processing processing was carried out before is spread from a polymer matrix, and it enters into the solvent of the layer of consecutiveness in \*\* arrival. Furthermore, since another phenomenon called a staining (contamination: staining) happens, the coloring matter in the solution of the color filter which is going to carry out \*\* arrival is spread in the color filter by which processing processing was carried out before. Both phenomena bring about mixing of coloring matter and make the chromaticity of a color filter decrease.

There are the U.S. No. 4,822,718, U.S. Pat. No. 4,876,165, and "the color filter (Color Filters From Dyed Polyimides) of the dyeing polyimide origin, W.Latham and D.Hawley work, Solid State Technology and the May, 1988 issue" as a conventional technique to which this invention person consents, and it quotes on these specifications by considering these indications as reference. Extraction and the effect by the staining have been decreased by using a polyimide precursor (polyamine acid) as a color filter matrix material (for example, indicated by U.S. Pat. No. 4,876,165 and U.S. Pat. No. 4,822,718). Moreover, it is also W.Latham to use coloring polyimide as a color filter. And D.Hawley It is indicated in "the color filter (Color Filters From Dyed Polyimides) of the coloring polyimide origin, Solid State Technology, and May, 1988" when it will depend. It reaches Latham. Hawley If it depends, the coloring polyimide stiffened in 230 \*\* for 1 hour will have given remarkable resistance to extraction and a staining to the film thickness of 1 to 2 micrometers. However, it depends for extraction of coloring polyimide and staining resistance on the amount of the coloring matter used, i.e., the ratio of a coloring matter pair polymer, the class of coloring matter, the setting time/temperature, and the structure of polyimide.

The polyimide used for a color filter must always be noticed about manufacture. There is humidity of monomer purity, the addition sequence of a monomer, the addition rate of a monomer, reaction temperature, the rate of stirring, time amount, and a perimeter etc. in the main factors which influence manufacture of polyimide as known well. In the color filter compound using polyimide, it is also known that it must be made to have to obtain the product of the engine performance according to the specification established by performing careful combination/evaluation.

Furthermore, if the polyimide used for a color filter is heated to sufficient temperature to obtain suitable hardening, the optical transparency will be spoiled to some extent. Loss of this optical transparency is shown by when a hardening film colors it yellow, and it is thought that this is based on formation of an electron donor acceptor complex.

Moreover, the color filter which uses polyimide as the base has a limitation in a shelf life (storage life). A polyimide precursor (polyamine acid) receives continuous meeting/dissociation of amide association, and brings about fluctuation of molecular weight with time. Like known, fluctuation of this molecular weight may carry out fluctuation of the thickness of a film by birth, when covering at a given spin rate (rotational speed), and it may need adjustment of down stream processing. indication of invention therefore, coating which the purpose of this invention was colored -- consecutiveness ---like -- \*\* arrival -- it is in offering the constituent which can form the transparent polymer film which faces carrying out and has staining stopping power.

The further purpose of this invention is to offer the constituent containing the organic coloring matter which can prevent extraction of coloring matter, when coating contacts a solvent in consecutive down stream processing.

Another purpose of this invention has an effective shelf life longer than the conventional technique, and is to offer the constituent which can manufacture the final product which maintains the workability according to the specification specified by this over the long period of time.

The purpose of this invention is to offer coating which does not cause extraction.

Other purposes of this invention are to offer the constituent which does not start a staining.

Still more nearly another purpose of this invention is to offer photosensitive coating used for an

information display unit and a sensor.

The purpose of this invention is to offer transparent barrier coating optically.

The purpose of this invention is used in any of the FOTORISO graphic method of a positive, and the FOTORISO graphic method of a negative, and is to offer the good color filter base material (base) of electrical characteristics including resistivity and dielectric strength.

The purpose of this invention is to offer a brightener / color contrast permeability film with brilliancy high about all colors rather than the conventional technique. For example, the penetrable film of this invention forms glossy high blue also for the blue twist of the conventional technique.

Another purpose of this invention is to offer the constituent which can be manufactured so that it may have the consistent property.

Still more nearly another purpose of this invention is to offer the constituent which has a shelf life longer than the conventional ingredient.

Other purposes of this invention are to offer an one component system.

The purpose of this invention is to offer the compound to which glass and other base materials may adhere certainly.

These purposes and the other purposes are attained as a single chemical combining the ingredient containing the reforming copolymer, two sorts, or the reactant (it can react to a carboxylic acid) functional group beyond it containing the side chain radical which consists of an anhydride (acid anhydride) according to this invention by offering polymer coating which has solvent resistance, the outstanding transparency, and outstanding thermal stability. If this invention is followed, graft association of the reactant bridge formation component will be carried out, and it is a polyfunctional bridge formation component (preferably block TOPORI isocyanate).

It was found out that the anhydride side chain radical content copolymer blended with (it can react to a carboxylic acid) has the outstanding transparency, thermal stability, solvent resistance, extraction resistance, and staining resistance.

The description of this invention will become still clearer by the following drawings and explanation of a desirable mode at this contractor.

Easy explanation of a drawing Drawing 1 is a graph which shows the extraction resistance of a color filter component according to this invention.

Drawing 2 is a graph which shows the extraction resistance of another color set according to this invention.

Drawing 3 shows the flow chart for preparing the test color wheel according to this invention.

Drawing 4 is a graph which shows the staining of coating by the conventional technique.

Drawing 5 is a graph which shows the protective effect of unblurred coating according to this invention.

Drawing 6 is a flow chart which shows preparation and the usage of unblurred coating according to this invention.

Drawing 7 is a graph which shows the protective effect at the time of using photosensitive unblurred coating according to one example of this invention.

Drawing 8 is a graph which shows the staining of coating and extraction resistance which were protected by unblurred coating according to this invention.

Drawing 9 is a graph which shows the extraction resistance obtained by photosensitive unblurred coating according to one example of this invention.

Drawing 10 is a graph similar to drawing 9 at the time of using the still thinner protective coating of thickness.

Drawing 11 is a flow chart which shows the color system by the conventional technique.

Drawing 12 is a flow chart which shows preparation of the color system according to this invention.

The best gestalt for inventing Although polymer coating of the transparency which has extraction and staining resistance will be obtained if this invention is followed for this reason, it is made to react with the polyfunctional component which has one sort of functional groups which can react the copolymer containing the side chain radical which consists of an anhydride

with this anhydride and heat, light, one sort that induction is chemically carried out and can cause polymerization-ization, or a functional group beyond it. as the copolymer containing the side chain radical which consists of an anhydride -- a maleic-anhydride-styrene copolymer (for example, the trade name from an Atochem company -- ")

SMA® 樹脂」として、また、Monsanto社から商品名「Scripset® 樹脂」として

What can come to hand, the thing which can come to hand from Aldrich and Monomer Polymer Dajac Labs further, a maleic-anhydride-methyl-vinyl-ether copolymer (for example) I S P Technologiesから商品名「Gantrez® A N コポリマー」として入手でき

\*\* -- or there is a maleic-anhydride-ethylene copolymer (for example, Zeeland Chemicals what can come to hand from a shrine) etc., and it is a maleic-anhydride-styrene copolymer preferably.

A polyfunctional component (a reactant graft component is called hereafter) is allylamine, a diaryl amine, 3-amino-1-propanol vinyl ether, allyl alcohol, 4-hydroxybutyl vinyl ether, glycerol dimethacrylate, 2-hydroxyethyl methacrylate, or 2-hydroxyethyl acrylate preferably. The stoichiometry of a reactant graft component to a side-chain anhydride is in the range of 0.5 to 1.0, and is 1.0 preferably. If a side-chain anhydride reacts to a reactant graft component, fission of this anhydride takes place, and when the functional group of an anhydride and the reactant graft component which reacts is subsequently a hydroxyl group a carboxylic acid (C=O telescopic motion, 1706-1760cm<sup>-1</sup>) and carboxylate (telescopic motion C=O --) When formation of 1715-1770cm<sup>-1</sup> and the functional group of an anhydride and the reactant graft component which reacts are amino groups, formation of an amide (C=O telescopic motion, 1630-1700cm<sup>-1</sup>) takes place. in addition, the thing showing the typical absorption frequency of the chemistry functional group which described the infrared C=O flexible frequency mentioned above -- it is -- the spectroscopy-identification (Spectrometric Identification) Silverstein and Robert M. of "organic compound; Bassler and G.Clayton ; Morrill and Terence C.; [ ] -- it is indicated by the 4th edition and U.S. New York State Wiley company issue." A reactant graft component can use these infrared-absorption frequencies for an anhydride content copolymer as an index of the reaction when carrying out graft association. It becomes easy to dissolve a graft copolymer in the rare water solution of a base material with the carboxylic acid produced as a result of hydroxyl group-containing compound or an amino-group content compound reacting to the anhydride functional group of a copolymer. It becomes the quantitative index of graft association having been attained that the dissolution rate in the inside of the rare water solution of a base material is increasing compared with the dissolution rate of the copolymer which is not graft-ized. In order to choose the quantitative scale of graft degree of coupling, the acid number is measured with the titration using a base.

Next, a graft-ized copolymer is mixed with the side-chain carboxylic-acid radical of this graft copolymer or an unreacted anhydride radical, and the bridge formation component that can react. As this bridge formation component, it is ME.

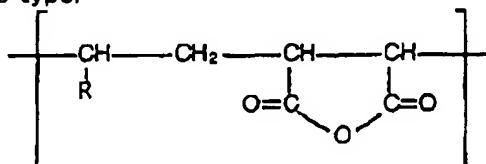
ラミン系硬化剤(例えば、Cytec Industries社から商品名 Cymel® で入手できる

A thing or polyfunctional isocyanate can be used. BUROKKUTO (blocked) diisocyanate is desirable as a bridge formation component, and block TOPORI isocyanate is more desirable. This kind of block TOPORI isocyanate is Miles. As a trade name "Desmodur" from a shrine, it can obtain as a trade name "Luxate" from Olin Chemicals. If block TOISO cyanate is used, the long 1 component compound of a shelf life can be prepared. It is because block TOISO cyanate is non-reactivity until this is heated by predetermined temperature. If block TOISO cyanate is heated to the deblock temperature, the isocyanate of "isolation" will be formed and the reaction of typical isocyanate will be attained.

Into a heat-curing process, a block TOISO cyanate functional group begins a deblock in the temperature of the range of 60 degrees C to 200 \*\* according to the class of used blocking agent, and forms the isocyanate of isolation. Thus, next, the isocyanate of the formed isolation reacts with the carboxylic-acid radical of a graft-ized copolymer as indicated in "the organic

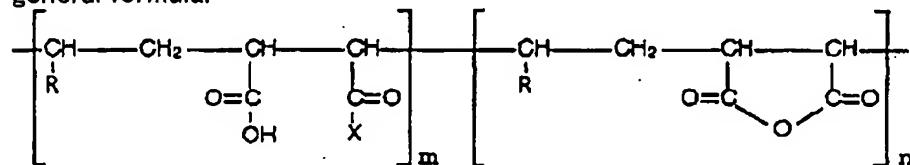
polymer chemistry (Organic Polymer Chemistry), U.S. New York State Chapman and Hall issue, and 1973" of KJ.Saunders work. Moreover, the secondary reaction reacted to other functional groups (for example, amide) in which isocyanate contains an unstable proton, and the isocyanate radical of further others may occur. By the reaction of such deblock isocyanate, much bridge formation arises in a polymer matrix. When a reactant graft component is the alkyl group of partial saturation, the unsaturated bond of the reactant graft component of a side chain joining together in the temperature exceeding 200 degrees C, and producing the further bridge formation is also considered. You may make it a reactant graft component contain the functional group (for example, acrylate radical) of optical cross-linking.

Generally the structure of the maleic anhydride used as a start ingredient can be expressed like a degree type.



ここで、Rは、H、-OCH<sub>3</sub>、-C<sub>6</sub>H<sub>5</sub>である。

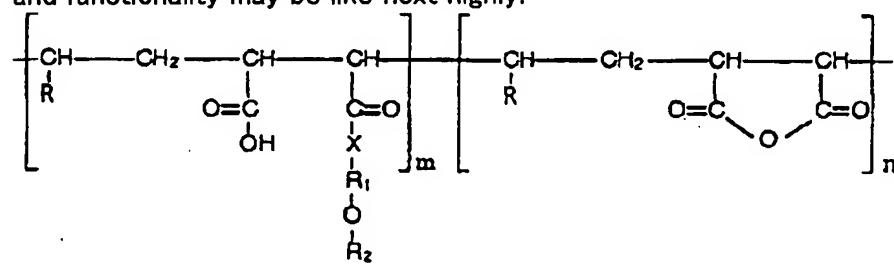
The structure of a graft-ized maleic-anhydride copolymer can be expressed with the following general formula.



(A)

(B)

Here, X is the unsaturated alcohol or the amine of the straight chain containing the carbon atom of about 2 to 20, or branching. The unsaturated alcohol and/or the amine of a straight chain or branching may be mixed. m -- 0.2 [ for example, ] from -- 1 -- it is -- n -- 0.8 [ for example, ] from -- it is 0. The substituent currently added to the anhydride may be still more complicated, and functionality may be like next highly.



Here, X is for example, an oxygen atom or a nitrogen atom. R1 is the divalent alkylene or its divalent oxy-alkylation derivative of the straight chain of the carbon atom of about 1 to 6, or branching. R2 is vinyl, acrylate, or a methacrylate radical. m -- 0.2 [ for example, ] from -- 1 -- it is -- n -- 0.8 [ for example, ] from -- it is 0.

\*\* arrival of the graft-ized copolymer / the block TOPORI isocyanate of this invention is carried out as it is, and it can give barrier coating of stability, chemoresistance nature, and extraction / staining resistance transparently and thermally to the optical target which has uniform coating thickness. Furthermore, the graft-ized copolymer / poly isocyanate blend of this invention can

also offer the homogeneous coloring film coating of the extraction / staining resistance used for the color filter for an information display and detectors combining a coloring agent.

According to a usage or an application, polymer coating (using together with a coloring agent or he has no coloring agent) of this invention can be made into the thickness of hundreds of A from several microns. The conventional spin coating responds to the rate which covers with the molecular weight and spin coating of a graft-ized copolymer, and, generally is about 0.1. A film with a thickness of 10 microns is given from mum. the class of base material with which, as for the typical rate for carrying out spin coating of the polymer coating (with a coloring agent, concomitant use, or no coloring agent) of this invention, coating is performed, magnitude, the copolymer to be used, and the molecular weight of a cross linking agent -- further -- the presentation of coating -- responding -- for example, 500rpm to 6000rpm It is in the range. Level of polymer solid content can be made high, and/or the larger polymer of molecular weight can be used, and a film with large thickness can be obtained by adopting the coating method of further others. The typical hardening process of polymer coating of this invention is carried out in the range for 60 minutes after for 10 minutes in 280 \*\* from 200 \*\*.

Using as a binder of a color or a pigment and forming the color filter array for a liquid crystal display, an electro luminescent display, a plasma display, and the electric charge joint devices for color video detectors as an example of the specific application of polymer coating of this invention, is mentioned. Furthermore, polymer coating of this invention can also be operated as barrier coating which extraction / staining resistance carries out \*\* arrival on coating which is not enough, and prevents the staining of this coating, and extraction. Moreover, in manufacturing a multilayer microcircuit, polymer coating of this invention can also be used as an interlayer dielectric. Furthermore, polymer coating of this invention is also applicable to manufacture of optical guided wave equipment.

Example 1 It is 800 in a reactor equipped with stirring equipment, nitrogen installation tubing, and a calcium chloride dry pipe. The allylamine of the N-methyl-2-pyrrolidinone of the section and the 49.8 sections is put in. The number average molecular weight after purging a reactor for several minutes with nitrogen is about 350,000. Acid number 473 It adds at once, stirring the styrene-maleic-anhydride copolymer [Aldrich (Aldrich) 18,293-1] 250.56 section. It is N-methyl-2-pyrrolidinone Further 100 Section addition is carried out and the rinse of the reactor wall is carried out. Stirring is continued for about 48 hours. In the infrared spectrum of the obtained polymer, the acid-anhydride absorption intensity in 1858cm<sup>-1</sup> and 1780cm<sup>-1</sup> is decreasing, and the new absorption band in 1732cm<sup>-1</sup> corresponding to C=O stretching vibration of a carboxylic acid and the 2nd class amide and 1646cm<sup>-1</sup> is looked at, respectively. the acid number of a product -- 157 it was .

Example 2 Number average molecular weight is about 350,000 in a reactor equipped with stirring equipment, nitrogen installation tubing, and a calcium chloride dry pipe. Acid number 473 The styrene-maleic-anhydride copolymer (Aldrich 18,293-1) 203.23 section and the N-methyl-2-pyrrolidinone 500 section are put in. After purging a reactor for several minutes using nitrogen, a reactor is heated in temperature of 25 to 75 degrees C in an electric heat mantle, stirring. After dissolving all solid content, a solution is left and it cools at about 35 degrees C. It is 48.50 to the N-methyl-2-pyrrolidinone of the 152.78 sections, stirring a solution. Dropping addition of the solution which melted the allylamine of the section is carried out. Stirring is continued under a room temperature for about 48 hours. the acid number of a product -- 159 it was .

Example 3 It is 100 in a reactor equipped with stirring equipment, nitrogen installation tubing, and a calcium chloride dry pipe. The N-methyl-2-pyrrolidinone of the section is put in. After purging a reactor for hundreds of minutes with nitrogen, the acid number is at about 1600-2600, and number average molecular weight is the styrene-maleic-anhydride copolymer (Monomer-Polymer & Dajac Labs. company make, catalog number 9182) 46.71 of 475. The section is added. N-methyl-2-pyrrolidinone -- further -- the rinse of the wall of the \*\*\*\* reactor for 20 sections is carried out. It is 13.19 to the N-methyl-2-pyrrolidinone of the 20 sections, stirring a solution. Dropping addition of the solution which melted the allylamine of the section is carried out. Stirring is performed to the bottom of a room temperature for about 24 hours. the acid number of a product -- 144 it was .

Example 4 The N-methyl-2-pyrrolidinone of the 50 sections, the diethylene-glycol wood ether of the 50 sections, and the allylamine of the 5.87 sections are put in in a reactor equipped with stirring equipment, nitrogen installation tubing, and a calcium chloride dry pipe. The number average molecular weight after purging a reactor for several minutes with nitrogen is about 350,000. The acid number is 473. The styrene-maleic-anhydride copolymer (Aldrich 18,293-1) 30 section is added in a stirring solution. 21.74 The N-methyl-2-pyrrolidinone of the section, and 21.74 The rinse of the wall of a reactor is carried out using the mixture of the diethylene-glycol wood ether of the section. Stirring is continued for about 48 hours. the acid number of a product -- 172 it was.

Example 5 Number average molecular weight is about 350,000 in a reactor equipped with stirring equipment, nitrogen installation tubing, and a calcium chloride dry pipe. The acid number is 473. The styrene-maleic-anhydride copolymer (Aldrich 18,293-1) 40.44 section and N-methyl-2-pyrrolidinone 100 The section is put in. It is the allyl alcohol of the 8.60 sections, and 23.56, stirring, after purging a reactor for several minutes with nitrogen. The solution which consists of the N-methyl-2-pyrrolidinone of the section is added, and, subsequently it is 15.00. The triethylamine of the section, and 23.56 The N-methyl-2-pyrrolidinone of the section is added. A reactor is heated at 50 degrees C - 65 degrees C in an electric heat mantle. Stirring is continued for about 48 hours. the acid number of a product -- 148 it was. polymer blend of the example 6 section 30.00 (the formation of an allylamine graft given in an example 1 -- the styrene-maleic-anhydride copolymer solution 150 section --) The block TOPORI isocyanate (Desmodur BL-3175A, product made from Miles) 51 section, Consist of the N-methyl-2-pyrrolidinone 10 section and the cyclohexanone 25 section. 26.55 N-methyl pyrrolidinone of the section 10.86 Cyclohexanone of the section Solvent blue 45 (Solvent Blue 45) of the 7.22 sections Solvent blue 67 (Solvent Blue 67) of the 2.40 sections  
10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

since -- blue (blue) coating was prepared by stirring this compound (mix) for about 12 hours using the coating combination which changes. Subsequently, the compound was filtered and ion exchange resin and insoluble matter were removed. This coating can use blue glow for making it penetrate alternatively from the light source of this panel back as a color filter of the multicolor pixel array for a full color flat panel form display. Furthermore, this coating can also be used for a semi-conductor photograph sensing element array as a color filter of the multicolor pixel array which lets blue glow pass alternatively. \*\* arrival of this coating can be carried out to a base material with the spin method or spray method used from the former, and it can be stiffened in 30 minutes in for [ 60 minutes ] or 250 \*\* in 230 \*\*. This coating can give a pattern by the plasma-etching method used from the former.

example 7 the following coating combination -- namely, -- 30.00 Polymer blend (thing given in an example 6) of the section 26.55 N-methyl pyrrolidinone of the section 10.86 Cyclohexanone of the section Solvent blue 38 (Solvent Blue 38) of the 5.61 sections

Solvent yellow 82 (Solvent Yellow 82) of the 4.03 sections

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Green (Green) coating was prepared by the same approach as example of \*\* 6.

example 8 the following coating combination -- namely, -- 30.00 Polymer blend (thing given in an example 6) of the section 26.55 N-methyl pyrrolidinone of the section 10.86 Cyclohexanone of the section Solvent yellow 82 (Solvent Yellow 82) of the 4.50 sections Solven tread 119 (Solvent Red ii9) of the 5.13 sections,

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Red (red) coating as well as a publication was prepared in \*\*\*\*\* and the example 6. polymer blend of the example 9 section 30.00 (the formation of an allylamine graft of example 1 publication -- the styrene-maleic-anhydride copolymer 150 section --) The block TOPORI isocyanate (Desmodur BL-4165 and Miles shrine make) 75 section, What consists of the N-methyl-2-pyrrolidinone 10 section and the cyclohexanone 25 section, 28.42 N-methyl

pyrrolidinone of the section 11.30 The cyclohexanone of the section, Solvent blue 45 (Solvent Blue 45) of the 7.47 section Solvent blue 67 (Solvent Blue 67) of the 2.49 sections, 10部の Dowex® HCR-S-Hイオン交換樹脂 (Dow Chemicals 社製)

since -- blue (blue) coating as well as a publication was prepared in the example 6 using the coating combination which changes.

example 10 the following combination -- namely, -- 30.00 Polymer blend (thing given in an example 9) of the section 28.42 N-methyl pyrrolidinone of the section Solvent blue 38 (Solvent Blue 38) of the 5.80 sections Solvent yellow 82 (Solvent Yellow 82) of the 4.16 sections, 10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

Green (Green) coating was prepared like \*\*\*\*\* and an example 6.

example 11 the following combination -- namely, -- 30.00 Polymer blend (thing given in an example 9) of the section 28.42 N-methyl pyrrolidinone of the section 11.30 Cyclohexanone of the section Solvent yellow 82 (Solvent Yellow 82) of the 4.65 sections Solven tread 119 (Solvent Red 119) of the 5.31 sections,

10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

Red (red) coating was prepared like \*\*\*\*\* and an example 6.

polymer blend of the example 12 section the following coating combination -- namely, -- 20.00 (the formation of an allylamine graft given in an example 1 — the styrene-maleic-anhydride copolymer solution 100 section --) The block TOPORI isocyanate (Desmodur BL-3175A, product made from Miles) 18.5 section, N-methyl-2-pyrrolidinone 28.68 The section and cyclohexanone 51.84 What consists of the section, 22.06 N-methyl pyrrolidinone of the section 11.03 Cyclohexanone of the section Solvent blue 38 (Solvent Blue 38) of the 3.36 sections, 10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

Copper rust color (cyanogen) coating was prepared like \*\*\*\*\* and an example.

example 13 the following coating combination -- namely, -- 20.00 Polymer blend (thing given in an example 12) of the section 17.78 N-methyl pyrrolidinone of the section Cyclohexanone of the 8.89 sections Solven tread 127 (Solvent Red 127) of the 2.40 sections,

10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

Purple red (Magenta) coating was prepared by the same approach as \*\*\*\*\* and an example 6.

example 14 the following coating combination -- namely, -- 20.00 Polymer blend (thing given in an example 12) of the section 24.89 N-methyl pyrrolidinone of the section 12.44 Cyclohexanone of the section Solvent yellow 82 (Solvent Yellow 82) of the 4.00 sections, 10部の Dowex® HCR-S-H イオン交換樹脂 (Dow Chemical社製)

Yellow (yellow) coating was prepared like \*\*\*\*\* and an example 6.

the polymer blend (the formation of an allyl alcohol graft given in an example 5 -- the styrene-maleic-anhydride copolymer solution 20.00 section --) of the 15 example 5.00 section The block TOPORI isocyanate (Desmodur BL-3175A, product made from Miles) 5.41 section, N-methyl pyrrolidinone 15.36 The section and diethylene-glycol wood ether 10.00 Consist of the section. N-methyl pyrrolidinone of the 1.00 section Diethylene-glycol wood ether of the 1.38 sections, Coloring matter material of the 4.92 section (56.25 [ N-methyl pyrrolidinone of the section, and 112.5 / Jetty RENGURI of the section ] solvent blues 45 and 18.75 of the section solvent blue 67,112.5 of the section)

コールジメチルエーテルから成るものを64部の Dowex® HCR-S-H (Dow Chemical

What performed filtration and removed ion exchange resin and insoluble matter after stirring on a shrine for 12 to 24 hours

since -- blue (blue) coating was prepared like the example 6 using the compound which changes.

coloring matter material of the 16 example 4.92 section the following coating compounds --  
namely, -- Polymer blend (thing given in an example 15) (43.65 [ The N-methyl-pyrrolidinone of  
the section, and 112.5 / Diethylene of the section ] solvent blues 38 and 31.35 of the section  
solvent yellow 82,112.5 of the section) of the 5.00 sections N-methyl pyrrolidinone of the 1.00  
sections Diethylene-glycol wood ether of the 1.38 sections

グリコールジメチルエーテルから成るものを64部の Dowex® HCR-S-H イオン交換

What performed filtration and removed insoluble matter after stirring on resin (product made  
from Dow Chemical) for 12 to 24 hours

since -- green (Green) coating was prepared like a publication in the example 6 using the  
compound which changes.

Coloring matter material of the 17 example 4.92 section Polymer blend of the 5.00 sections  
(thing given in an example 15) (35.03 [ The N-methyl-pyrrolidinone of the section, and 130 /  
Jetty RENGU of the section ] solvent yellow 82 and 39.97 of the section the solven tread 119 of  
the section, and 130) N-methyl pyrrolidinone of the 1.00 sections Diethylene-glycol wood ether  
of the 1.38 sections

ルコールジメチルエーテルから成るものを64部の Dowex® HCR-S-H イオン交換樹

What filtered and removed insoluble matter after stirring in the top made from fat Dow Chemical  
since -- red (red) coating was prepared like the example 6 using the coating compound which  
changes.

example 18 the following combination -- namely, -- Graft-ized copolymer (thing given in an  
example 1) of the 5.50 sections Block TOPORI isocyanate (Desmodur BL-3175A, product made  
from Miles) of the 1.93 sections Solvent blue 67 (Solvent Blue 67) of the 1.19 sections Solvent  
Brown 44 (Solvent Brown 44) of the 1.64 sections 11.31 Cyclohexanone of the section N-  
methyl-2-pyrrolidinone of the 4.13 sections, 10部の Dowex® HCR-S-H イオン交換樹脂

Black (black) coating was prepared like a publication in the \*\*\*\*\* example 6.

example 19 the following combination -- namely, -- Graft-ized copolymer (thing given in an  
example 1) of the 6.37 sections Block TOPORI isocyanate (Desmodur BL-3175A, product made  
from Miles) of the 2.17 sections Cyclohexanone of the 3.56 sections Unblurred coating was  
prepared by stirring this compound for about 1 hour using the N-methyl-2-pyrrolidinone of the  
3.42 sections. Next, it is a compound 0.2 It filtered using mum filter. This coating can be used for  
preventing extraction of the coloring matter from a color filter, and preventing the color filter in  
consecutive down stream processing as a transparency barrier layer on a color filter. Various  
kinds of coloring matter (color) is added, and although it is transparent in specific wavelength,  
coating which is opaque can be manufactured in other wavelength. for example, opaque on other  
wavelength, although it is transparent in the spectrum used for opting for alignment -- it is --  
carrying out -- coating can be manufactured as colored.

Example 20 It is 1000rpm on a glass base material with a diameter of 3 inches about the blue  
filter compound indicated in the example 6. \*\* arrival was carried out with the spin coating  
method for 90 seconds, it heated to 100 during 30 - 60 seconds \*\* on the hot plate, preheating  
was carried out to 170 \*\* for 30 minutes all over the usual furnace, and ignition (hardening) was  
carried out for 30 minutes in 250 \*\* all over the further usual furnace. The thickness (thickness)  
of a film was 1.45 micrometers. It is shown in drawing 1, using the transparency spectrum of the  
color filter after hardening as Rhine a. Dry nitrogen was poured and it dried, after making the  
glass base material with which \*\* arrival of the coating was carried out immersed in N-methyl-  
2-pyrrolidinone for 30 seconds next. A transparency spectrum is measured again and it is shown  
in drawing 1 as Rhine b. After coating was performed and the glass base material was again  
immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A  
transparency spectrum is measured again and shown in drawing 1 as Rhine c.

Example 21 It is 1000rpm on a glass base material with a diameter of 3 inches about the green  
filter compound indicated in the example 7. \*\* arrival was carried out by spin coating for 90

seconds, it heated for 30 – 60 seconds to 100 \*\* on the hot plate, preheating was carried out to 170 \*\* for 30 minutes in the usual furnace, and it ignited for 30 minutes to 250 \*\* in the further usual furnace (it was made to harden). Film thickness was 1.24 micrometers. Rhine d of drawing 1 shows the transparency spectrum of the color filter after hardening. Next, after the glass base material by which coating was carried out was immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and it is shown as Rhine e of drawing 1. After the glass base material by which coating was carried out was again immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and shown as Rhine f of drawing 1.

Example 22 It is 1000rpm on a glass base material with a diameter of 3 inches about the red filter compound indicated in the example 8. \*\* arrival was carried out by spin coating for 90 seconds, it heated for 30 – 60 seconds to 100 \*\* on the hot plate, preheating was carried out to 170 \*\* for 30 minutes in the usual furnace, and it ignited for 30 minutes to 250 \*\* in the further usual furnace (it was made to harden). Film thickness was 1.36 micrometers. Rhine g of drawing 1 shows the transparency spectrum of the color filter after hardening. Next, after the glass base material by which coating was carried out was immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and it is shown as Rhine h of drawing 1. After the glass base material by which coating was carried out was again immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and shown as Rhine i of drawing 1.

Example 23 It is 2000rpm on a glass base material with a diameter of 3 inches about the copper rust (cyanogen) color filter compound indicated in the example 12. \*\* arrival was carried out by spin coating for 90 seconds, and it heated for 30 – 60 seconds to 100 \*\* on the hot plate, and ignited for 30 minutes to 250 \*\* in the further usual furnace (it was made to harden). Film thickness is 0.579. It was mum. Rhine a of drawing 2 shows the transparency spectrum of the color filter after hardening. Next, after the glass base material by which coating was carried out was immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and it is shown as Rhine b of drawing 2. After the glass base material by which coating was carried out was again immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and shown as Rhine c of drawing 2.

Example 24 It is 2000rpm on a glass base material with a diameter of 3 inches about the yellow filter compound indicated in the example 14. \*\* arrival was carried out by spin coating for 90 seconds, and it heated for 30 – 60 seconds to 100 \*\* on the hot plate, and ignited for 30 minutes to 250 \*\* in the further usual furnace (it was made to harden). Film thickness is 0.585. It was mum. Rhine d of drawing 2 shows the transparency spectrum of the color filter after hardening. Next, after the glass base material by which coating was carried out was immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and it is shown as Rhine e of drawing 2. After the glass base material by which coating was carried out was again immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and shown as Rhine f of drawing 2.

Example 25 It is 2000rpm on a glass base material with a diameter of 3 inches about the \*\*\*\* (Magenta) color filter compound indicated in the example 13. \*\* arrival was carried out by spin-coating for 90 seconds, and it heated for 30 – 60 seconds to 100 \*\* on the hot plate, and ignited for 30 minutes to 250 \*\* in the further usual furnace (it was made to harden). Film thickness is 0.708. It was mum. Rhine g of drawing 2 shows the transparency spectrum of the color filter after hardening. Next, after the glass base material by which coating was carried out was immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and it is shown as Rhine h of drawing 2. After the glass base material by which coating was carried out was again immersed in N-methyl-2-pyrrolidinone for 30 seconds, dry nitrogen was poured and it dried. A transparency spectrum is measured again and shown as Rhine i of drawing 2.

example 26 the following combination -- namely, -- Graft-ized copolymer (thing given in an

example 1) of the 6.37 sections Block TOPORI isocyanate (Desmodur BL-3175A, product made from Miles) of the 2.17 sections Cyclohexanone of the 3.56 sections Unblurred coating was prepared by stirring this compound for about 1 hour using the N-methyl-2-pyrrolidinone of the 3.42 sections. Next, 0.2 It let it pass in mum filter, and the compound was filtered. This coating can be used for preventing extraction of the coloring matter from a color filter as a transparency barrier layer on a color filter, and preventing the staining of the color filter in consecutive downstream processing.

Example 27 In order to evaluate staining resistance of the compound of an example 25, it was shown in drawing 3 and 3 color color wheel was prepared on the diameter glass base material of 3 inches according to the process similar to downstream processing used for making a color filter plate. The process of preparation of this color wheel is as follows.

1) It is 1220rpm about coating of an example 25. \*\* arrival was carried out as an unblurred barrier coat by spin coating for 90 seconds, and it heated to 100 during 30 - 60 seconds \*\* on the hot plate, and ignited in 60 minutes to 250 \*\* in the usual furnace (it was made to harden). The thickness of a film is 1.1. It was mum. The spectrum of the unblurred coat obtained according to this process is shown as Rhine a of drawing 4.

2) It is 1200rpm by spin coating, and they are for 90 seconds and a red filter (Brewer S). science社製、 Pic® Red 101)を施着し、ホットプレート上で100°Cに30~60秒間

It heated and heated for 30 minutes to 164 \*\* in the further usual furnace.

3) It is 5000rpm by spin coating. Activity photoresist of for 30 seconds and a positive (Shipley Microposit® 1400-27)を施着し、ホットプレートで100 °Cに30秒間加

It became hot.

4) Next, this sample was exposed through the wedge mask arranged on the base material by which coating was carried out from the contact printer (contact print equipment) to the photochemistry line (150 mJ/cm2).  
5) Carry out a rinse by deionized water after making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, and they are an exposure resist and lower layer Red 101. It removes and is Red 101. It left the diameter pattern of a semicircle. Red 101 \*\* which remains upwards

露光レジストは Safestrip® (Brewer Science社製) を用いて除去した。次に、

Red 101 which remains It ignited for 10 minutes to 280 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, it is Red 101. Film thickness (thickness) was 1.25 micrometers. Red 101 after this process And the spectrum of an unblurred coat is shown in drawing 4 as Rhine b and c, respectively.

6) They are for 90 seconds and a green filter (Brewer S) at 1200rpm by spin coating. science社製、 Pic® Green 02) を施着し、ホットプレート上で100 °Cに30~60秒

It heated in between and heated for 30 minutes to 170 \*\* in the further usual furnace. Spin coating

により5000rpm で30秒間、ポジの作業フォトレジスト (Shipley Microposit® 14

\*\* arrival of 00-27 was carried out, and it heated for 30 seconds to 100 \*\* with the hot plate. Next, the wedge mask which is arranged on the base material by which coating was carried out, and was made to rotate 90 degrees of this sample from the location in a process 4 is minded, and it is a photochemistry line (150 mJ/cm2) from a contact printer. It was alike and exposed.

7) After making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, the rinse was carried out by deionized water, an exposure resist and lower layer Green 02 were removed, and it left the diameter pattern of a semicircle of Green 02. Un-exposing [ which remains on Green 02 ].

レジストを Safestrip® (Brewer Science社製) を用いて除去した。次に、残存

Green 02 to carry out was ignited for 60 minutes to 230 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, the film thickness of Green 02 was about 1.20 micrometers. Green 02 after this process, and Red 101 And the spectrum of an unblurred coat is shown in drawing 4 as Rhine d, e, and f, respectively.

8) They are for 90 seconds and a blue filter (Brewer S) at 1000rpm by spin coating.  
science社製、Pic® EXP93004) を施着し、ホットプレート上で100 °Cに30~60秒

It heated in between and heated for 30 minutes to 155 \*\* in the further usual furnace. Spin coating

により5000rpmで30秒間、ポジの作業フォトレジスト (Shipley Microposit® 14

\*\* arrival of 00-27 was carried out, and it heated for 30 seconds to 100 \*\* with the hot plate. Next, the wedge mask which is arranged on the base material by which coating was carried out, and was made to rotate 90 degrees of this sample from the location in a process 6 is minded, and it is a photochemistry line (150 mJ/cm<sup>2</sup>) from a contact printer.

It was alike and exposed.

9) After making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, the rinse was carried out by deionized water, an exposure resist and lower layer EXP93004 were removed, and it left the diameter pattern of a semicircle of EXP93004. Un-exposing [ which remains on EXP93004 ].

レジストを Safestrip® (Brewer Science社製) を用いて除去した。次に、残存

EXP93004 to carry out was ignited for 60 minutes to 230 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, the film thickness of EXP93004 was about 1.00 micrometers. EXP93004 and Green02 after this process, and Red 101 And the spectrum of an unblurred coat is shown in drawing 4 as Rhine g, h, i, and j, respectively.

In drawing 4, it is based on thermal dark color-ization that the permeability of the unblurred coat shown in Rhine a, c, f, and j is decreasing slightly. either of the consecutive color filter down stream processing -- a staining -- the proof on the spectrum in which being generated is shown is not seen. It is shown that Rhine g of drawing 4 is based on a staining from the consecutiveness process of a blue filter, and the permeability of a red filter is decreasing.

The 2nd color wheel was prepared according to the above-mentioned processes 1-9. However, \*\* arrival of the unblurred coat of an example 25 was carried out as the 2nd coat in this case after processing processing of a red filter which was indicated at the process 5. It is 6000rpm by spin coating. For 90 seconds, \*\* arrival of the 2nd unblurred coat was carried out, it was heated for 30 - 60 seconds at 100 degrees C on the hot plate, and was heated for 60 minutes to 250 \*\* in the further usual furnace. As the 1st color wheel was indicated at processes 1-9; the unblurred coat and the transparency spectrum of each color filter were measured after each hardening heating. Rhine a-j of drawing 5 corresponds to Rhine a-j of drawing 4 in the same down stream processing. Rhine g of drawing 5 has suggested that the staining of a red filter has not happened by the \*\* arrival of a consecutive blue filter. It is based on thermal dark color-ization of coloring matter that the permeability of the red filter shown by Rhine g of drawing 5 is decreasing slightly.

Example 28 It is 50.00 in stirring equipment and a reactor equipped with a calcium chloride dry pipe. Section Saf  
esstrip® (Brewer Science社製) を入れ、これに、数平均分子量が約1900で酸価

\*\* 290 Styrene-maleic-anhydride copolymer 40.00 (Atochem SMA3000A) The section is added. 2-hydroxyethyl acrylate 12.00 after all solid content dissolves (HEA) (AMmade from RohmTech-414) The section and ten drops of triethylamines (Aldrich 23,963-3) are added. Stirring is continued under a room temperature for about 24 hours.

The example 29 section, JIPENTA ERIS toll PENTA / HEKISA acrylate 100mL Graft-ized polymer 29.82 prepared in the example 27 in the polyethylene beaker (Brewer S)

science社製) 5.00部、および Safestrip® (Brewer Science社製) 8.69部を添加

It carries out. This compound (mix) is stirred under a room temperature for 1 hour, and is saved for 14 days into a bottle with an amber polyethylene \*\*\*\*\* cap.

The example 30 section, block TOPORI isocyanate Compound 10.00 prepared in the example 28 (Desmod)

ur B1-3175A. Miles社製) 1.90部、 Safestrip® 20.00部、イソプロピルチオキ

Sun Tong (ITX) (product made from First Chemical) 1.00 section, octyl-Para-(dimethylamino) benzoate (ODAB) 0.50 section and 1, and 4-diazabicyclo [2.2.2] octane 0.025 (Aldrich D 2,780-2) The activity photoresist of an optical transparent negative is prepared by combining the section. This compound is stirred under a room temperature for 1 hour, and it is 0.2. It filters with the filter of mum.

Example 31 In order to evaluate the compound of an example 29, it was shown in drawing 6 and 3 color color wheel was prepared on the glass base material with a diameter of 3 inches according to the process similar to the process adopted as preparing a color filter plate. The preparation process of this color wheel is as follows.

1) It is 1000rpm by spin coating, and they are for 90 seconds and a red filter (Brewer S). science社製、 Pic® Red 02) を施着し、ホットプレート上で30秒間100 °Cに加熱

It carried out and heated for 30 minutes to 151 \*\* in the usual furnace.

2) spin coating -- 4000rpm it prepared in the example 29 for 90 seconds -- it was transparent, \*\* arrival of the activity photoresist of a negative was carried out, and it heated for 3 minutes to 100 \*\* with the hot plate.

3) Next, after exposing this sample from a contact printer to a photochemistry line (150 mJ/cm<sup>2</sup>) through the wedge mask arranged on the base material by which coating was carried out, it heated for 2 minutes to 100 \*\* on the hot plate.

4) After making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, a rinse is carried out by deionized water, a non-exposing resist and lower layer Red 02 are removed, and it leaves the diameter pattern of a semicircle of Red 02, and was made for the layer of a transparent transparence resist to be in a crowning. Red 02 and the transparence resist which remain were ignited for 30 minutes to 230 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, the film thickness of Red 02 is about 1.2. It was mum. The film thickness of a transparence resist was about 0.35 micrometers. The spectrum of Red 02 by which the coat was carried out by the transparence resist after this process is shown in drawing 7 as Rhine a.

5) They are for 90 seconds and a green filter (Brewer S) at 1100rpm by spin coating.

science社製、 Pic® Green 02) を施着し、ホットプレート上で100 °Cに30秒間加

It became hot and heated for 30 minutes to 165 \*\* in the further usual furnace. It is the activity photoresist (Sh) of a negative at the transparence prepared in the example 29 for 90 seconds by 4000rpm with spin coating.

ipley Microposit® 1400-27)を施着し、ホットプレートで100°Cに3分間加熱し

\*\*. Next, this sample was exposed from the contact printer to the photochemistry line (150 mJ/cm<sup>2</sup>) through the wedge mask which it is arranged on the base material by which coating was carried out, and was rotated 90 degrees from the location in a process 3.

6) After making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, the rinse was carried out by deionized water, a non-exposing resist and lower layer Green 02 were removed, and it left the diameter pattern of a semicircle of Green 02. Next, Green 02 and the transparence resist which remain were ignited for 30 minutes to 230 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, the film thickness of Green 02 was about 1.20 micrometers. The film thickness of a transparence resist was about 0.35 micrometers. The spectrum of Red 02 by which the coat was carried out by Green 02 by

which the coat was carried out by the transparency resist after this process, and the transparency resist is shown in drawing 7 as Rhine b and c, respectively.

7) They are for 90 seconds and a blue filter (Brewer S) at 1200rpm by spin coating.

science社製、Pic® Blue 10)を施着し、ホットプレート上で100 °Cに30秒間加熱

It carried out and heated for 30 minutes to 160 \*\* in the further usual furnace. It is 4000rpm by spin coating. \*\* arrival of the activity photoresist of a negative was carried out for 90 seconds by the transparency prepared in the example 29, and it heated for 3 minutes to 100 \*\* with the hot plate. Next, this sample was exposed from the contact printer to the photochemistry line (150 mJ/cm<sup>2</sup>) through the wedge mask which it is arranged on the base material by which coating was carried out, and was rotated 90 degrees from the location in a process 5.

8) Carry out a rinse by deionized water after making a sample immersed in tetramethylammonium hydroxide (TMAH) of 0.27 N for 20 seconds, and they are a non-exposing resist and lower layer Blue 10. It removes and is Blue 10. It left the diameter pattern of a semicircle. Next, Blue 10 which remains And the transparency resist was ignited for 30 minutes to 230 \*\* in the usual furnace (it was made to harden). According to the analysis certificate, the film thickness of Green 02 was about 1.20 micrometers. The film thickness of a transparency resist was about 0.35 micrometers. Blue10 by which the coat was carried out by the transparency resist after this process, Green 02 by which the coat was carried out by the transparency resist, and Red 02 spectrum by which the coat was carried out by the transparency resist are shown in drawing 7 as Rhine d, e, and f, respectively.

In drawing 7 , although that the permeability of Red 02 shown by Rhine a, c, and f and the permeability of Green 02 shown by Rhine b and e are decreasing slightly is one thing of the color filter down stream processing of the formation of the thermal dark color, and consecutiveness based a little on that staining, the effect is very small.

The 2nd color wheel was prepared according to the above-mentioned process of 1-9. However, it is Blue 10 after the development in TMAH. It does not ignite (it is not made to harden), instead a color wheel is arranged on a spinner (rotor plate), and it is 2000rpm. The spray (spraying) of the N-methyl-2-pyrrolidinone was carried out for 10 minutes from the squeeze bottle, making it rotate.

For 80 more seconds, the color wheel was rotated and desiccation of this wheel was promoted. Drawing 8 is each ignition and Blue 10. The spectrum of Red02 and Green02 after removal is shown, Rhine a, c, and e shows the transparency spectrum of Red 02, and Rhine b and d shows the transparency spectrum of Green 02. It is based on thermal disassembly of coloring matter that permeability is decreasing slightly about Red02 and Green02. Blue 10 by the N-methyl-2-pyrrolidinone from these spectrums Removal is [ having not given the staining to Green02 and Red02 and ] Blue 10. It is shown in the removal process that there is no coloring matter extraction from Green02 and Red02.

Example 32 The coat of the blue filter ingredient (EXP94056, product made from Brewer Science) was carried out to the glass base material with a diameter of 3 inches of three sheets for 90 seconds by 800rpm by spin coating. Each sample was heated for 30 seconds on the hot plate. The sample 1 was heated for 30 minutes to 250 \*\* in the usual furnace, and the sample 2 was heated for 60 minutes to 230 \*\* in the usual furnace, and it heated the sample 3 for 30 minutes to 165 \*\* in the usual furnace further. 1:1 dilution liquid of the resist of transparency given [ with spin coating ] in an example 29 at a sample 2 Safestr*i*p® (Brewer Science社製) を施着した。透明レジスト稀釀液のスピニコート

NGU is 1000rpm. It carried out for 90 seconds and heated for 30 minutes to 100 \*\* with the hot plate after that. Exposure processing was carried out using the contact printer (150 mJ/cm<sup>2</sup>), and this sample was held to 230 during 30 minutes \*\* in the usual furnace. It was 0.39 micrometers when film thickness was measured from the spin curve. In a sample 3, it is 5000rpm by spin coating. For 90 seconds, after carrying out \*\* arrival of the above-mentioned transparency resist dilution liquid, it heated to 100 during 3 minutes \*\* with the hot plate. This sample was held for 30 minutes by 230 \*\* in exposure processing (150 mJ/cm<sup>2</sup>) and the usual

furnace using the contact printer. It is 0.1 when film thickness is measured from a spin curve. It was mum. Each sample was made immersed in N-methyl-2-pyrrolidinone, and the solvent drag was measured. Before and after immersing to N-methyl-2-pyrrolidinone, the spectrum of each sample was measured. The sample 1 exfoliated from the base material during N-methyl-2-pyrrolidinone immersion. Rhine a of drawing 9 is the transparency spectrum of the blue filter of the sample 2 before carrying out \*\* arrival of the transparency resist. Rhine b of drawing 9 is the transparency spectrum of a sample 2 with which \*\*\*\*\* arrival of the transparency resist was carried out. Rhine c of drawing 9 shows the transparency spectrum of a sample 2 (after making it immersed in N-methyl-2-pyrrolidinone for 30 seconds) with which \*\*\*\*\* arrival of the transparency resist was carried out.

Rhine a of drawing 10 is the blue filter of a sample 3, and shows the transparency spectrum after carrying out the transparency resist \*\* arrival and stiffening it. A transparency resist is the sample 3 by which \*\*\*\*\* arrival was carried out, and Rhine b of drawing 10 shows the transparency spectrum after making it immersed in N-methyl-2-pyrrolidinone for 30 seconds. Although the case where a vehicle and fusibility used a separate thing in an above-mentioned example was shown, you may make it coloring matter accomplish a part of polymer, for example, it may combine with the polymer as an addition compound. Furthermore, you may be the polymer to which a polymer makes the light of desired wavelength filter and penetrate, and eliminates other wavelength.

Probably, it will be clear to this contractor for many modification included by the technical thought of this invention indicated on these specifications to be possible to this invention. the specific operative condition which indicated this invention on these specifications -- therefore, it is not limited like and set by only the claim.

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[Translation done.]

\* NOTICES \*

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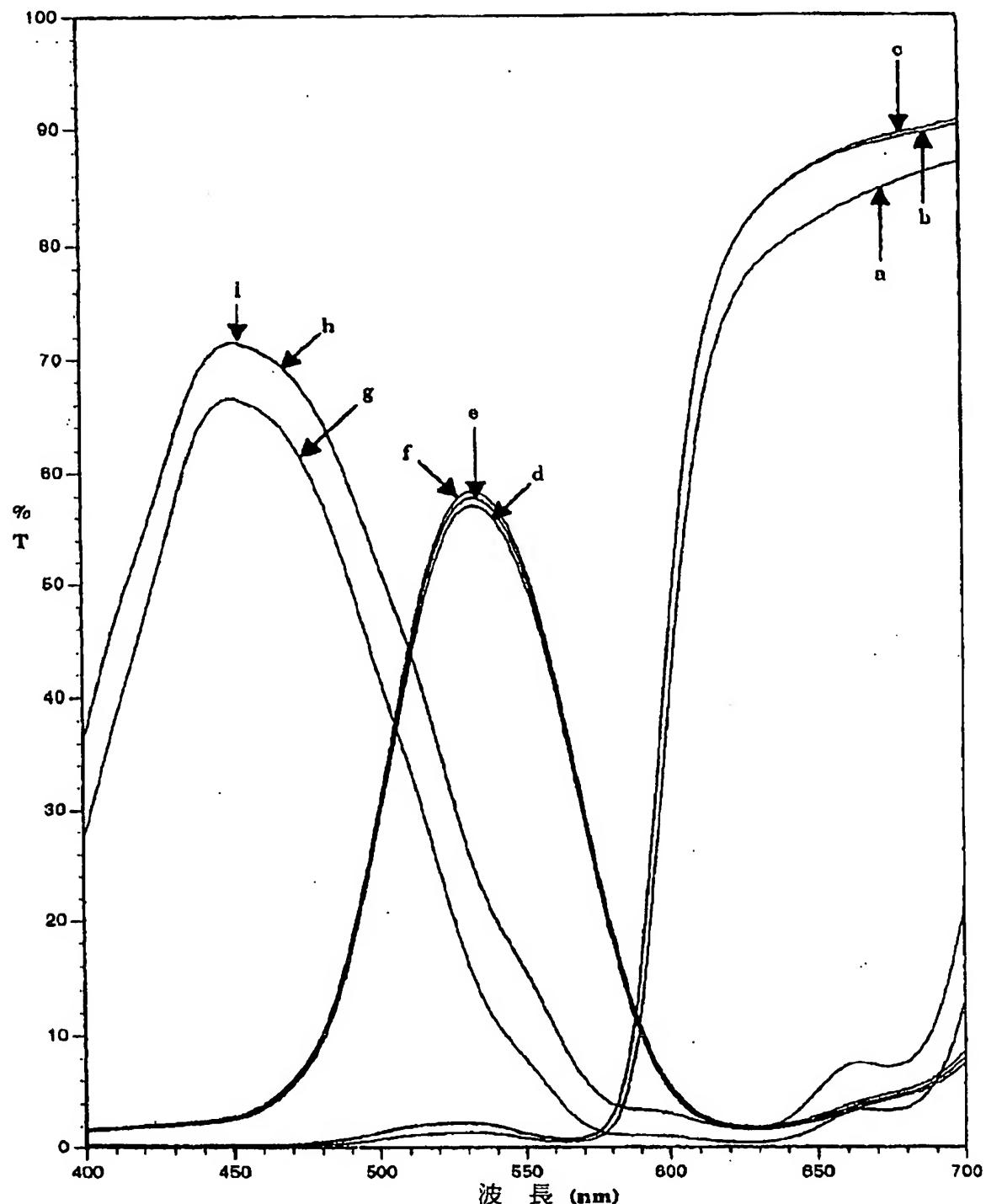
1. This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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DRAWINGS

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[Drawing 1]



*Fig. 1*

[Drawing 2]

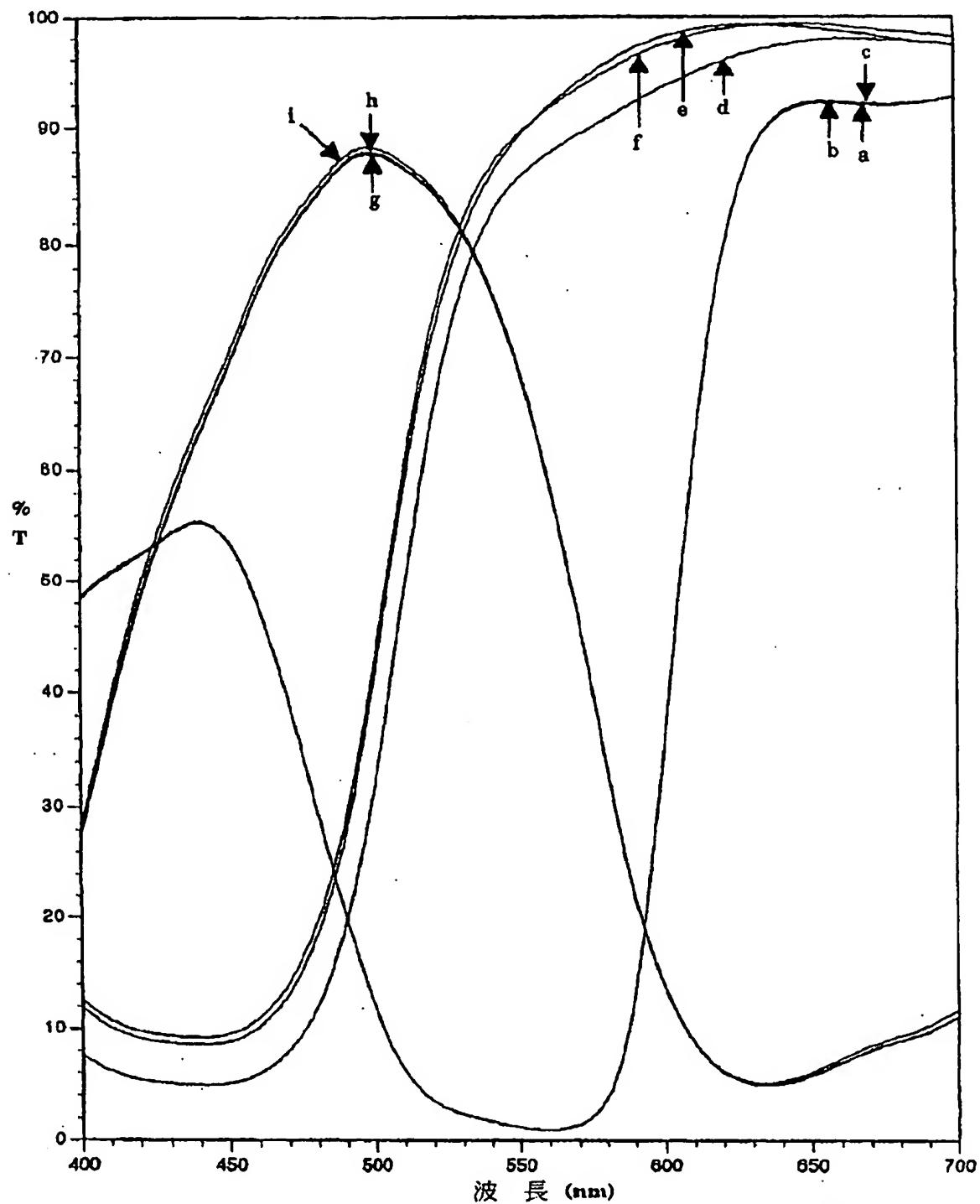


Fig. 2

[Drawing 3]

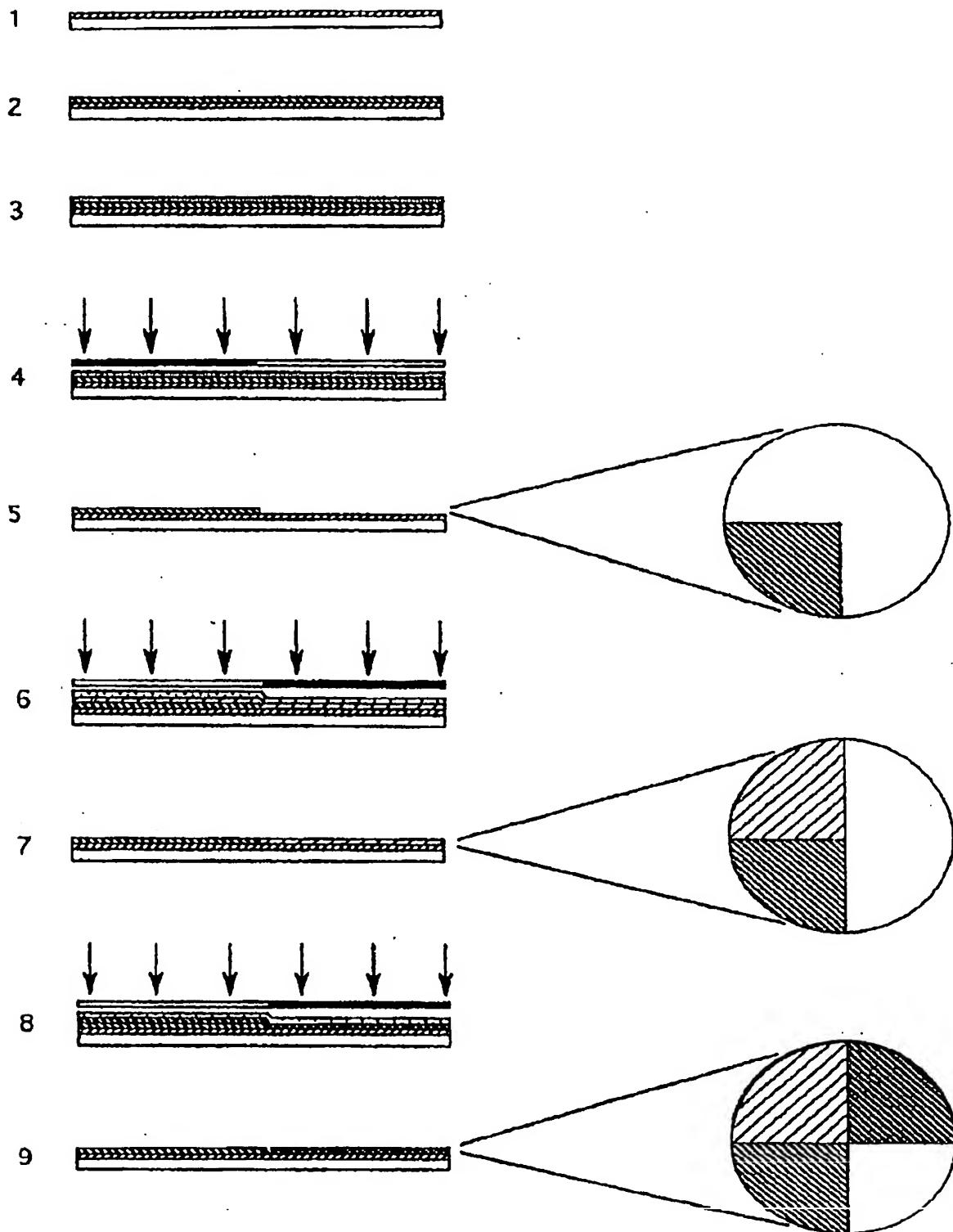


Fig. 8

[Drawing 4]

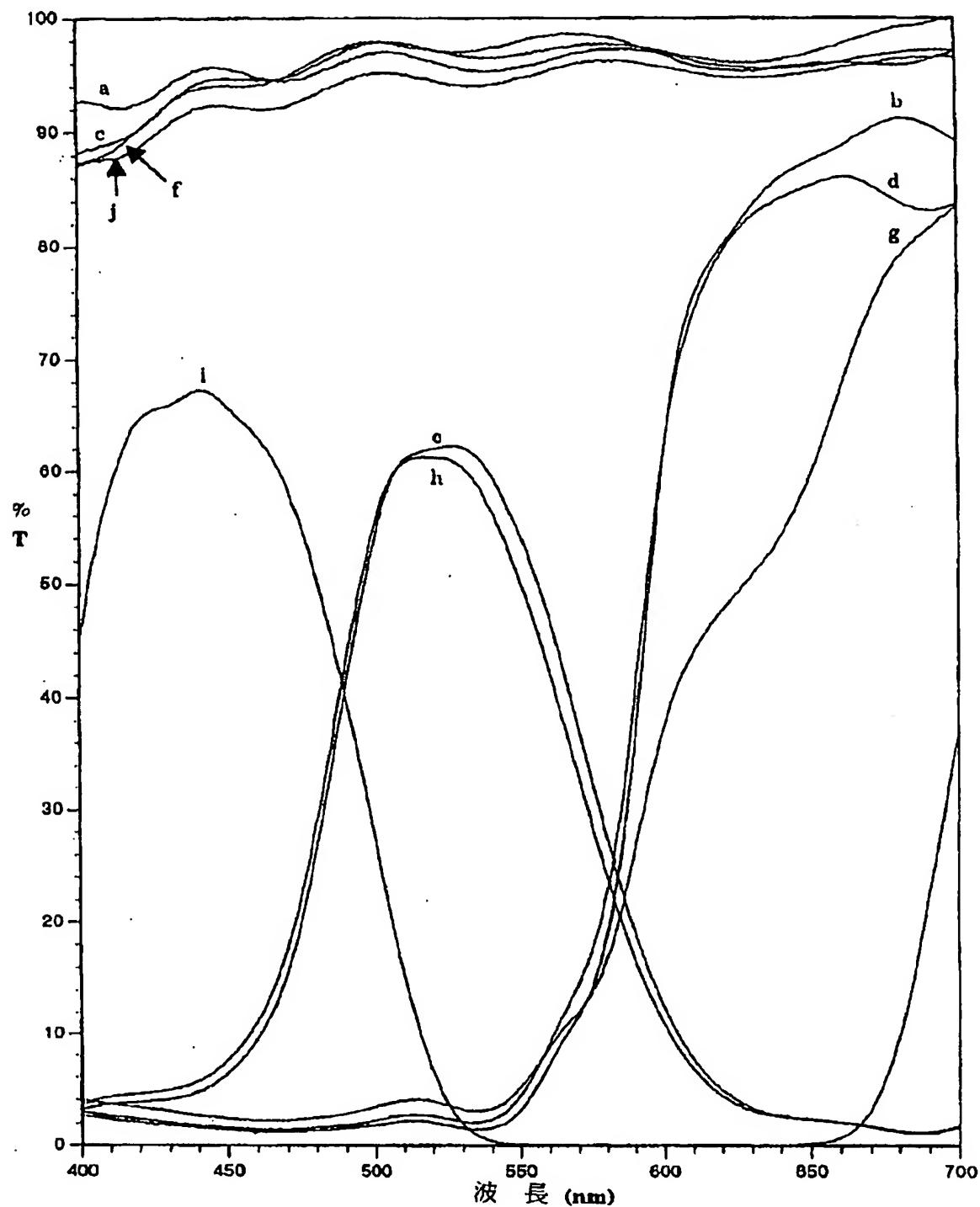


Fig. 4

[Drawing 5]

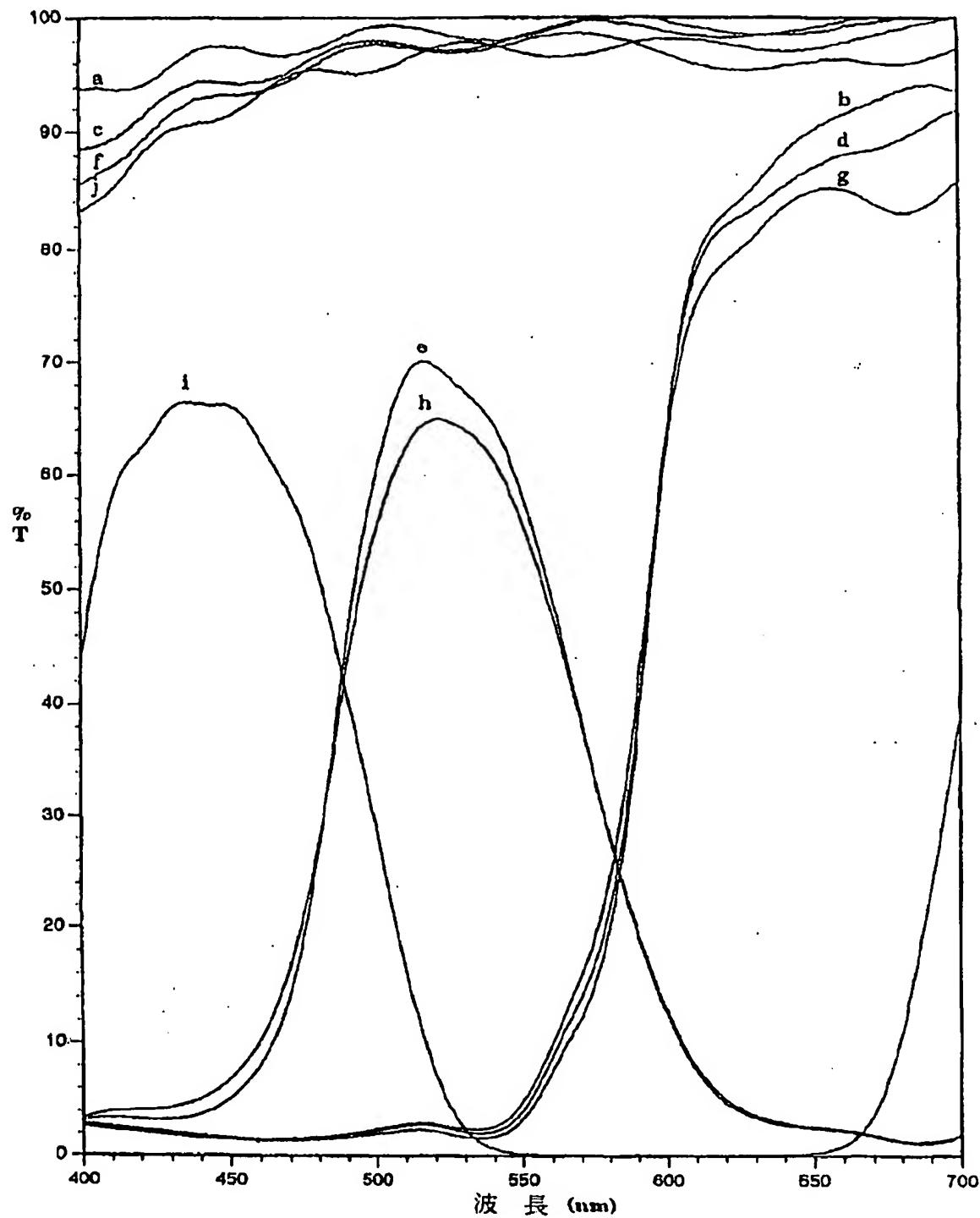
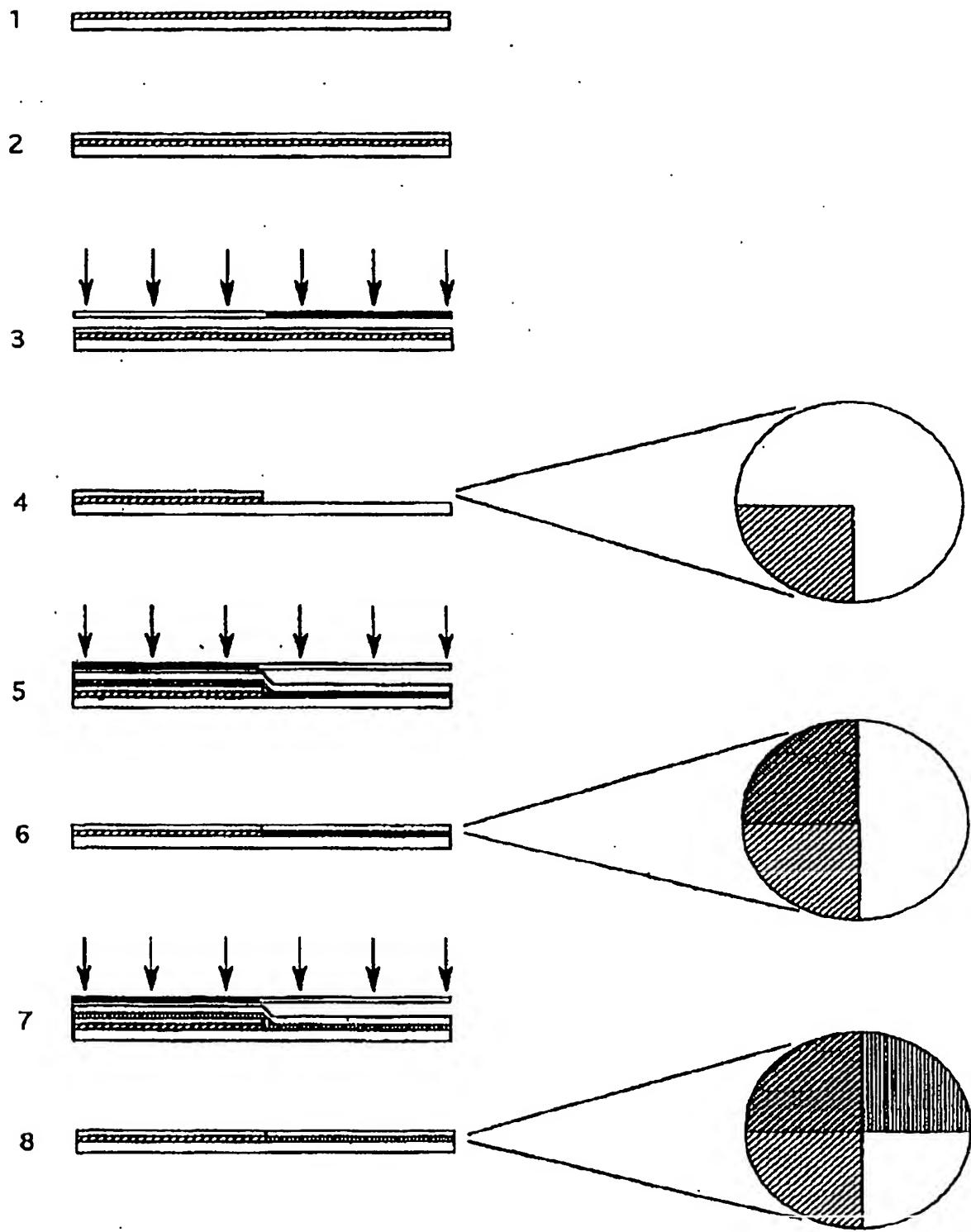


Fig. 5

[Drawing 6]



**Fig. 6**

[Drawing 7]

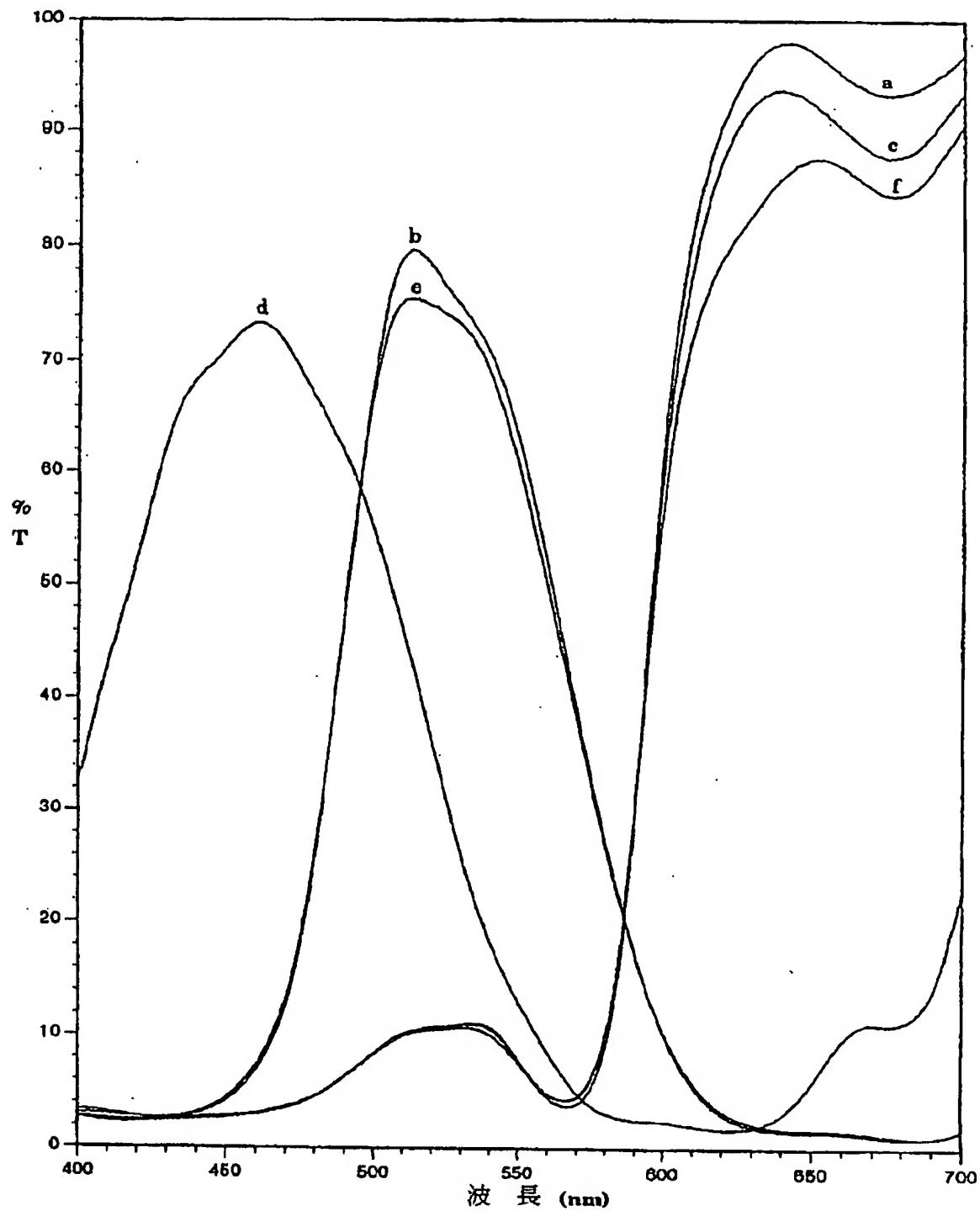


Fig. 7

[Drawing 8]

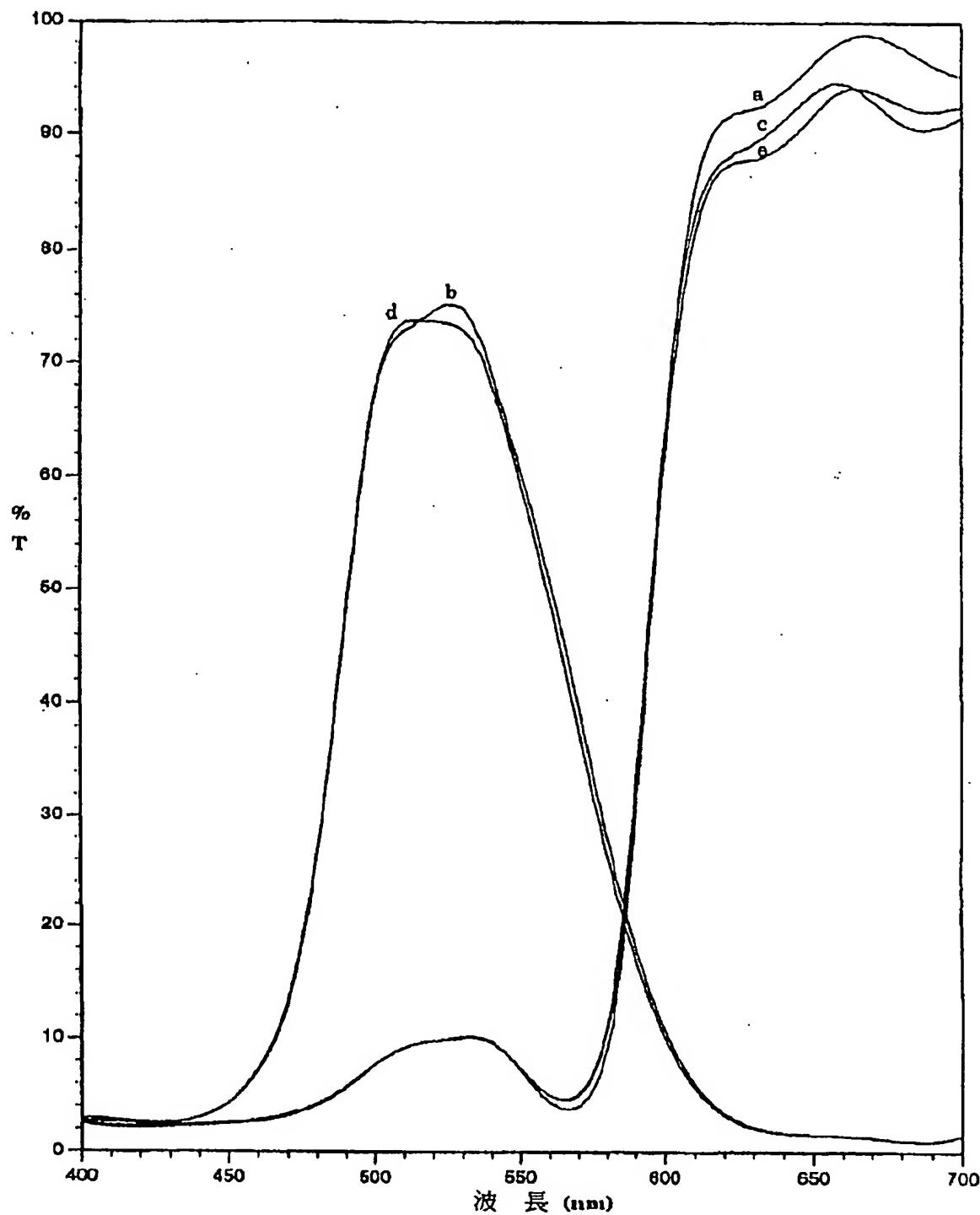


Fig. 8

[Drawing 9]

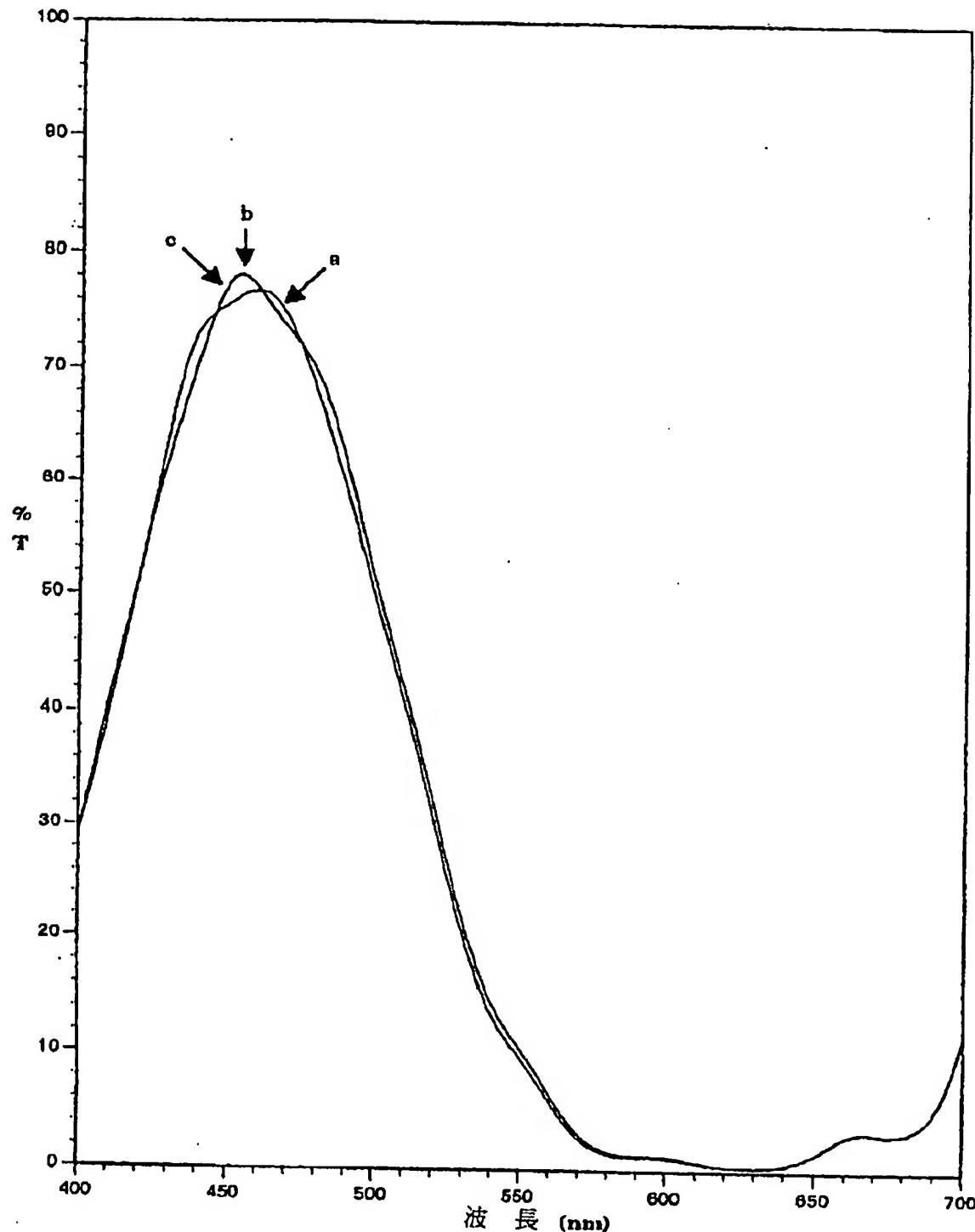


Fig. 9

[Drawing 10]

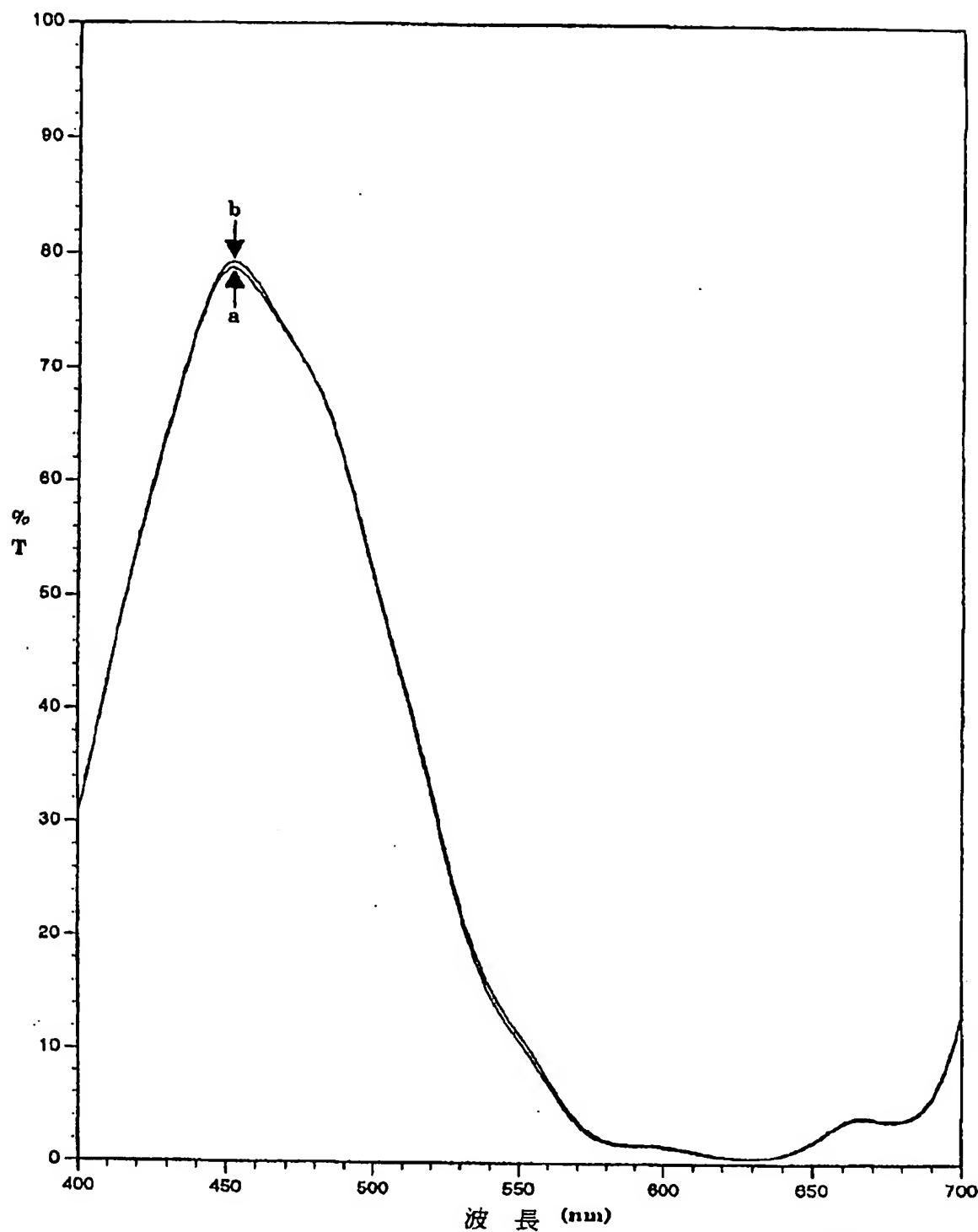
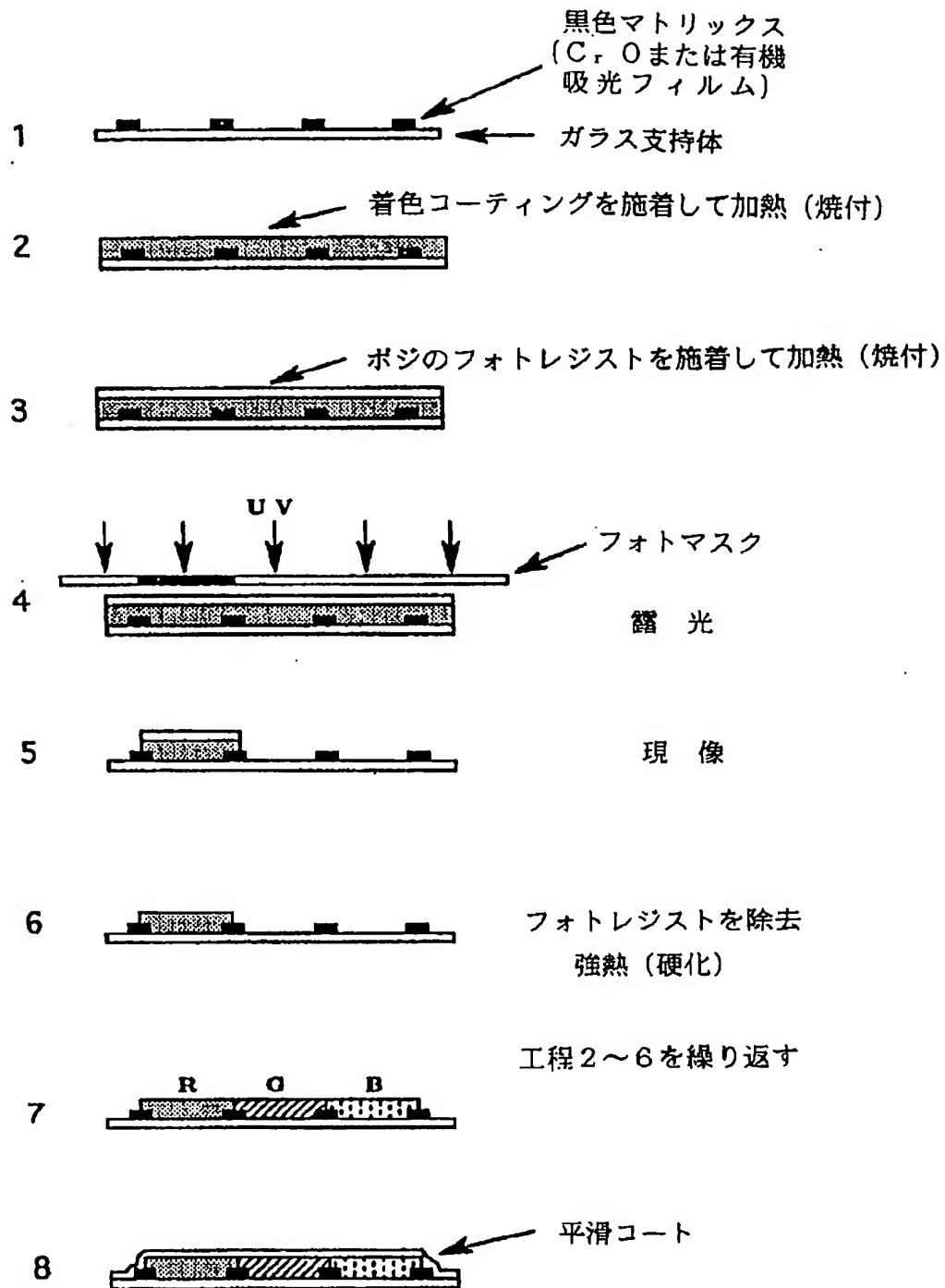


Fig. 10

[Drawing 11]



*Fig. 11*

[Drawing 12]

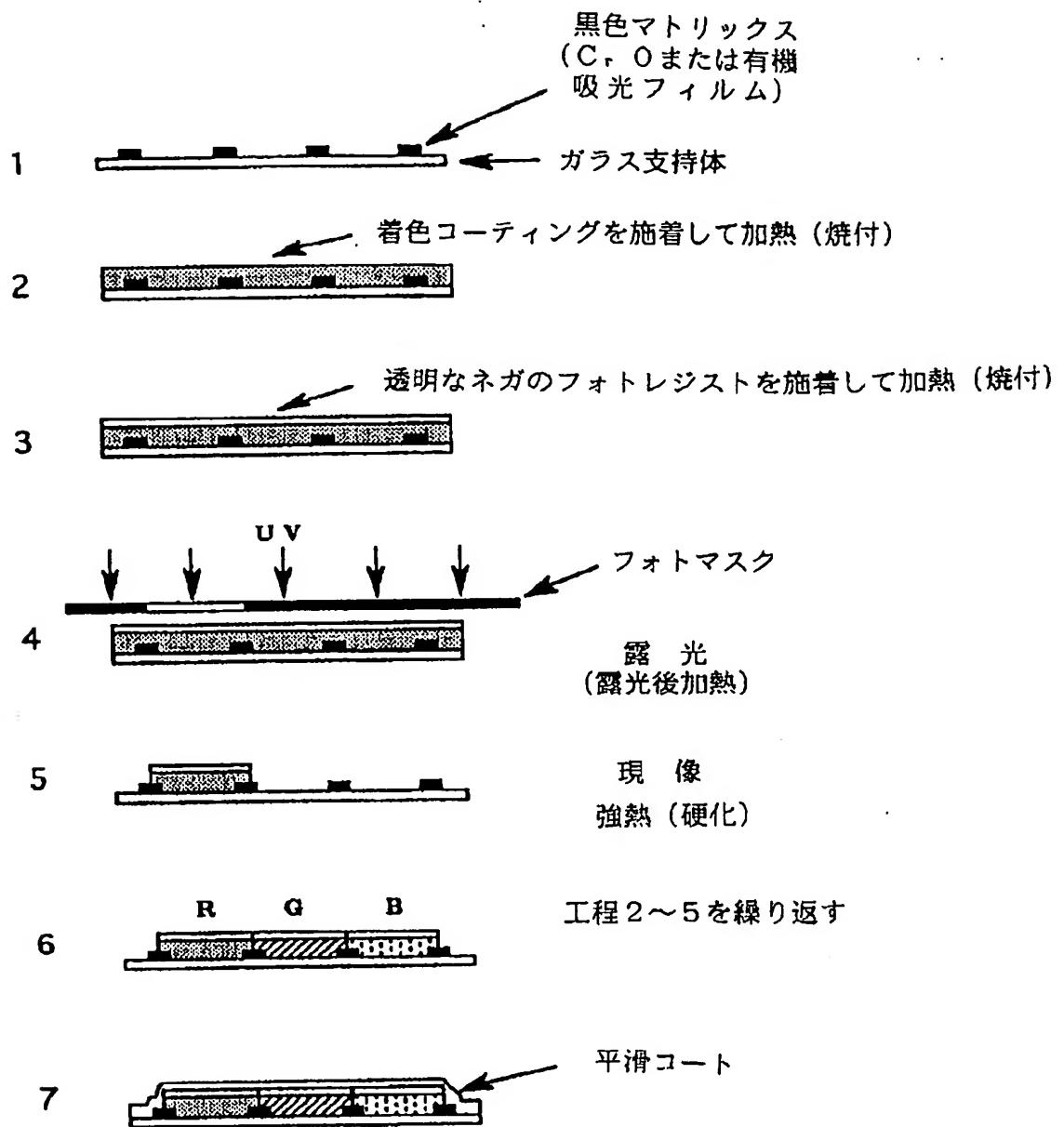


Fig. 12

[Translation done.]

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 (51)【国際特許分類第6版】

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## (57)【要約】

色フィルターアレイに用いられる色フィルター素子を製造する方法、および該方法に用いられる材料を開示している。該材料としては、改質(無水マレイン酸ースチレン)コポリマーおよびそれに類縁するポリマー類がある。該ポリマーは、保護またはプロッキングコーティングおよび抗漫出/ステイニングコーティングとして明澄または部分的に明澄なビヒクルとして用いられる。さらに、該ポリマーは、色素と組み合わせて、各色に対する素子を製造するのにも用いることができる。これら

の材料は従来からのフォトリソグラフ法に適合し得るものである。

【特許請求の範囲】

1. フォトリソグラフィにより色フィルター素子を製造する方法において、フィルター支持体に実質的に非粒子状のフィルター材料の層を施着し、ここで、該フィルターコーティング材料がビヒクルとそれに混合された可溶性色素とを含み、該可溶性色素が熱的に安定であり該ビヒクルと組み合わせられてバックライトのレベルを低くしながら高い色コントラストと明度を生じるようにする工程、フィルター支持体上のフィルターコーティング材料の層にフォトレジストを施着する工程、フォトリソグラフィによりフォトレジストに像を形成し現像して該フォトレジストにパターンを形成する工程、パターン形成されたフォトレジストをエッチングすることにより該パターンをフィルターコーティング材料に転写して、色フィルター材料に色フィルター素子のパターンを形成する工程、色フィルター素子を硬化させて該素子を実質的に不溶化する工程を含み、硬化した該フィルター素子が、着色光を高い明度を有しながら確実に透過させ分解する安定な色素を含有し、さらに、硬化した該フィルター素子が、後続のフィルターを隣接して施着することによる漫出およびステイニングに対して高い抵抗性を有する安定な色素を含有しているようにすることを特徴とする方法。
2. 支持体が、複数の色に対するフィルター素子から成る実質的に平面状のアレイによりコートされていることを特徴とする請求項1の方法。
3. 色フィルター素子内のフィルターコーティング材料を配向させてアラインメントを行う工程を含むことを特徴とする請求項2の方法。
4. 配向したフィルターコーティング材料に液晶材料を施着する工程を含むことを特徴とする請求項3の方法。
5. ビヒクルは、反応性架橋成分がグラフト結合し、且つ多官能性架橋成分とブレンドされた無水物含有改質コポリマーを含むことを特徴とする請求項1の方法。
6. マイクロフォトリソグラフィによりマイクロ電子フィルター素子を製造する方法において、フィルター支持体に実質的に非粒子状のフィルター材料の層を施着し、ここで、該フィルターコーティング材料がビヒクルとそれに混合された可溶性色素とを含み、該可溶性色素が熱的に安定であり該ビヒクルと組み合わせられてバックライトのレベルを低くしながら高い色コントラストと明度を生じるようにする工程、色フィルター材料上にパターンを形成し、エッチングを行い色フィルター素子を形成する工程、色フィルター素子を硬化させて該素子を実質的に不溶化させる工程、着色されたフィルター素子にバリヤーコーティングを施着する工程、バリヤーコーティングを硬化させて該バリヤーコーティングを実質的に不溶化する工程を含み、硬化したフィルター素子が、着色光を高い明度を有しながら確実に透過させ分解する安定な色素を含有し、さらに、硬化したバリヤーコーティングが、後続のフィルターを隣接して施着することによる漫出およびステイニングに対して高い抵抗性を与えるようにすることを特徴とする方法。
7. マイクロフォトリソグラフィによりマイクロ電子フィルター素子を製造する方法において、フィルター支持体に実質的に非粒子状のフィルター材料の層を施着し、ここで、該フィルターコーティング材料がビヒクルとそれに混合された可溶性色素とを含み、該可溶性色素が熱的に安定であり該ビヒクルと組み合わせられてバックライトのレベルを低くしながら高い色コントラストと明度を生じるようにする工程、フィルター支持体上のフィルターコーティング材料の層に感光性バリヤーコーティングを施着する工程、リソグラフィーにより感光性バリヤーコーティングをパターン形成し、該感光性バリヤーコーティングのパターンを現像する工程、エッチングにより該パターンをフィルターコーティング材料に転写して、パターン形成されたバリヤーコーティングで覆われた色フィルター素子を形成する工程、色フィルター素子およびバリヤーコーティングを硬化させて該色フィルター素子およびバリヤーコーティングを実質的に不溶化する工程を含み、硬化した色フィルター素子が着色光を高い明度を有しながら確実に透過させ分解する安定な色素を含有し、さらに、硬化したバリヤーコーティングが、後続のフィルターを隣接して施着することによる漫出およびステイニングに対して高い抵抗性を与えるようにすることを特徴とする。
8. フォトリソグラフィに用いられる吸光性コーティング材料であって、ビヒクルとそれに混合された可溶性吸光色素とを含み、該可溶性色素が熱的に安定でありビヒクルと組み合わせられてバックライトのレベルを低くしながら高い色コントラストと明度を生じるものであり、該ビヒクルは、反応性架橋成分がグラフト結合され且つ多官能性架橋成分とブレンドされた無水物含有改質コポリマーを含むことを特徴とするコーティング材料。

9. パターン形成されたフィルター素子を有する色フィルター支持体であって、該フィルター素子が、実質的に非粒子状のフィルターコーティング材料を含み、該フィルターコーティング材料が、ビヒクルとそれに混合された可溶性色素とを含み、該可溶性色素は熱的に安定でありビヒクルと組み合わせられてバックライトのレベルを低くしながら高い色コントラストと明度を生じるものであり、さらに、該フィルター素子が隣接フィルターからの浸出およびステイニングに対して高い抵抗性を有することを特徴とする色フィルター支持体。

10. ビヒクルは、反応性架橋成分がグラフト結合し且つ多官能性架橋成分とブレンドされた無水物含有改質コポリマーを含むことを特徴とする請求項9のフィルター支持体。

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